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ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND CLASS MATTER.

[OFFICIAL NOTICE.]

Twelfth Annual Meeting of the American Gas Light Association.

OFFICE OF THE AMERICAN GAS LIGHT ASSOCIATION,
32 PARK PLACE, NEW YORK, N. Y., Sept. 12, 1884.

As announced in the last issue of the JOURNAL, the Twelfth Annual Meeting of the American Gas Light Association will be held at Washington, D. C., on Wednesday, Thursday and Friday, the 15th, 16th and 17th of October next. The headquarters of the Association, during our stay at the Capital of the Union, will be at Willards, a hotel which is eminently adapted for the accommodation of a convention like ours. The sessions of the Association will be held at Willard's Hall, which is directly connected with the hotel. The hall is well adapted for our purpose, its seating capacity being all-sufficient for our requirements, yet not so superabundantly ample as to make us liable to feel lost in space; and situated as it is on a street laid with asph lt pavement, the members will be able to make themselves heard without first drowning the noises resulting from passing vehicular traffic.

In truth, the surroundings of our approaching annual convention are more than ordinarily auspicious this year. Good hotel and hall accommodations are desiderata of no small consideration, and when we add to these the many attractions of Washington, with its possibilities for sight-seeing, coupled with the privilege of viewing the works of the Washington Gas Light Company, which have been changed in some important particulars since last we met at the seat of the National Government, we think enough is said to make the members feel that the last convention made a happy choice when they selected Washington as the place for holding our Twelfth Annual Meeting.

It is, however, to be hoped that the many attractions which the city offers will not lead to forgetfulness of the main aim and purpose of our yearly assemblages, but that it may be remembered that to give and to receive information is the corner stone on which our Association rests; if the members were more mindful of this truism it is more than probable the Secretary would not experience so much difficulty in procuring papers for our meetings. It is certainly regrettable that members have been so backward in responding to the many appeals which the Secretary has made in his effort to fill up the literary part of the programme for the coming meeting, and it is to be hoped that our list of papers will be increased before the middle of October.

While it is expected there will be ample accommodation at the hotel for all the members, it may, however, be well to say to those who wish to secure rooms in advance that they can do so by writing direct to the hotel manager.

Very respectfully,
C. J. RUSSELL HUMPHREYS, Secretary.

THE WASHINGTON MEETING.

If "forewarned is forearmed," the members of the American Gas Light Association can have but little cause for complaint on the score of failing to receive proper, timely and repeated notification of the approach of the dates set apart for holding the Twelfth Annual Convention. The successor of Captain White to the Secretaryship of the national body of gas engineers has amply demonstrated his fitness for the position, and if his attention to detail and routine matters, entailing a vast amount of tedious and exacting work, be properly appreciated by the members in the shape of a generous

and hearty response to the suggestions made by him at various times through the columns of the JOURNAL, Mr. Humphreys will feel amply repaid for his labors. So often have the great benefits arising from membership in these organizations been pointed out by us that it would now be almost a work of supererogation to again revert to them. However, the conditions which made such membership valuable in the past prevail with just as certain a degree of potency at the present time; and, in fact, these conditions must continue to increase and gather force with the progress and development of the business of gas manufacture. It is perfectly safe to say that the production of artificial light has become one of the most important questions of the present day; and that system which succeeds in best meeting the wants of the masses in regard to relative economy, safety and convenience of light supply, is the one that is destined to hold the world as its empire. An impartial survey of the situation discloses the fact that, despite the vigorous assaults made upon its citadel, illuminating gas is master of the field, and every indication of the present time leads up to the gratifying knowledge that such mastery is to be of certain continuance. The great advances made in our business, even during the last twelvemonth, were little short of wonderful; and considering this ratio of progress, we must of necessity feel somewhat inclined to seek a solution for the causes that have paved the way thereto. True, the country's growth has been rapid—both as to population and wealth—and no small portion of the increased volume of the gas maker's business must be traced to these causes. Granting the natural sources of increase their rightful proportion to the total, we still must look for other reasons before arriving at a satisfactory final conclusion; and these reasons we think are embraced in the statement that the gas maker has learned how to carry on the operations of the industry in which he is engaged with far greater foresight and intelligence. And this is the point we would wish to make, and one which we unhesitatingly affirm to be true—that our associations of gas engineers have been the real instruments in the dissemination and diffusion of the principles of intelligent management. If the gas men of the country agree with us in this belief—and we rather incline to the idea that they do—the importance of keeping up a high standard of organization in our National Association is thus shown to be a matter of absolute necessity, and should be no less a matter of duty. This JOURNAL has long since maintained that each gas company in the United States ought to have a representative on the muster-roll of some one of the gas engineers' associations, and that representative, in every possible case, should be the engineer or superintendent of the works. The foregoing statement applies to every company, be it large or small. Some of the owners of the very small plants may say that it would be too expensive a proceeding for them; but there is where the grave mistake is made. The money expended in this direction will return itself over and over again. The hearing of one simple sentence falling upon the ears of an intelligent man, and stored up by a retentive memory, would often result in the saving of ten times the money spent in paying the necessary expenses of the company's delegate. Those possibly are homely matters to descant upon, but this JOURNAL seeks to serve as best it may the interests of the whole profession, and never forgets that the smallest gas plant in the country forms an important part of the common circle.

But to return to the subject proper. There is one feature in connection with the proceedings at the coming meeting that we hope will receive attention. This is in relation to the grading of the membership into classes. Such a system has been found to work exceedingly well in the English and French Associations; and there would seem to be no reason why it would not prove advantageous in our own. When this subject was broached some year or two ago, objection was made that, were such a practice instituted, it would look like conceding too much to foreign notions. Even supposing it had that appearance, if foreign rules are good ones, why should not they be followed here? Their adoption would simply be taking advantage of what was known to work well in practice, and for no other reason. Still, this is a particular for the Association itself to attend to, and we merely throw out the suggestion as possibly possessing matter for consideration.

As Secretary Humphreys says, Washington, D. C., is a splendid locality for the purposes of the convention, and the pleasure of once again meeting with Mr. George A. McIlhenny will bring many an otherwise doubtful attendant to the capital of the country. We urge upon the members the necessity of keeping up the good work, and continuing on in the search for enlightenment, so that the advances made within the past decade will count for but little when placed in comparison with the results to be registered as having been achieved in the era to come.

AN ADMIRABLE REPORT, WITH SOME REFLECTIONS THEREON.

On pages 143-4 of this issue we reproduce a synopsis of the Thirty-seventh Annual Report of the operations of the Providence Gas Light Company, of Providence, R. I. We have often impressed upon the attention of the executive officials of our gas companies the good results likely to follow from the general publication of such matter, thinking that this course would, in many instances, be an effectual bar to the plunderers who are so fond of parading as philanthropists. The time of high gas prices has seen its day in this country, and so also has been relegated to the care of the past the period of paying extortionate and extravagant dividends. Capital is undoubtedly worthy of its proper interest returns, just as certainly as the laborer is worthy of his hire; but capital ceases to merit protection when it assumes the proportions of an arrester of public progress—at least, such are the theories put forward by the tongues and pens of the shining lights among our later-day economists. Not caring to dispute the truth or falsity of these premises, we, in our own less extended sphere, have but to pay attention to the question only in so far as it applies to the matter of protecting honest capital invested in the business of the gas manufacturer. We have always adhered to the correctness of the policy of paying a fair rate of dividend on gas stocks, for reasons which in themselves are eminently practical. The gas purveyor, when obtaining the right to build a gas works, receives, at the outset, certain privileges from the community in which he proposes to operate; in short, without municipal consent he is powerless to proceed. The business of supplying artificial light in cities and towns, and particularly gas light, was long ago recognized as amounting to a public necessity, second in importance only to the supply of water. Keeping these things in view, it would seem, then, that the gas maker had a right to assist the public in obtaining its light at as low a figure as was consistent with a proper, and only a proper, return in the shape of dividend on the money invested. But if he were not willing to accept that as sufficient reason for the low rate of remuneration, he could hardly be blind enough not to see that such a course would be the best way of intrenching himself from the attacks of opposition, naturally enough directed toward the point where immoderate profits were supposed to be gained. We have urged low prices for gas simply on the ground that they meant safety; and have paid but little heed to the consumer's side of the question, for seldom has the consumer shown the least desire or disposition to deal in a fair-minded spirit with the gas maker.

The admirable document presented to the stockholders of the Providence Gas Light Company, at the annual meeting of September 1st, furnishes the most interesting sort of reading, and also serves to illustrate quite plainly many important things. A glance through its contents shows that those in charge of the company are fully alive to the policy of keeping up with the best principles of construction. Reference is made to the improvements in plant, and, among other items, we note that the advanced system of handling the ammoniacal liquor, lately introduced, promises to return a substantial gain to income account. The send-out for the past year shows an increase of 15,713,000 cubic feet, or about 5 per cent. over that of 1883; while compared with the send-out of 1880 the gain is shown to be 25 per cent. This increase, too, may be set down as in great part accounted for by the successive reductions that have been made in selling prices. In pursuance of this policy it is stated in the report that a reduction of 10 cents per thousand, bringing the price down to $1.80, will be made on the 1st of next October; the gas supplied to street lamps is charged for at the rate of $1.50.

It is shown that three and two-thirds miles of mains were laid during the year, the total length of conduits figuring up at 142¾ miles. It is noted that the coal contracts of the present year were made at lower prices than ever before secured, quality and class of supply being taken into consideration. One of the most gratifying exhibits in the company's report is the statement that the receipts for residuals amounted to 33⅓ per cent. of the first cost of the coal worked. But as the document under consideration is reprinted in this number, we refer our readers to where it may be found in its proper place.

What we desire to call particular attention to is the fact that Providence is threatened by the raiders once more; and that an application has been made for the right to operate another gas works there. The capital stock of the Providence Gas Light Company is divided into 50,000 shares, which is distributed amongst 883 stockholders, and one-half of this total is held and owned by women, guardians of minor children, trustees of estates, and charitable institutions. For twenty-five years the dividends paid by this company have averaged but 8 per cent., and during all the inflated, reckless, and extravagant financial periods belonging to our rebellion times, these dividends never exceeded 10 per cent. How it can by any means be shown that the Providence company has ever followed other than a proper course and spirit in dealing with the matter of gas supply in that city is beyond our ken; and we are bound to the belief that the municipal authorities of the city will not give their consent to the establishment of a crusade against a corporation which has so honestly carried out its obligations. Sneerers and scoffers are apt to deride the claims of women and children for equitable protection. Indeed, these are the sort of people whom they like to triumph over; and should the requests of the oppositionists meet with favor at the hands of the authorities, great will be their opportunities for such achievements at Providence, R. I.

Annual Report of the Operations of the Providence (R. I.) Gas Light Company.

The thirty-seventh annual meeting of the stockholders of the Providence (Rhode Island) Gas Light Company was held at the office of the Company, Market square, Providence, on date of Monday, September 1st, the President, Mr. Amos C. Barstow, in the chair. The minutes of the last meeting were read by the Secretary, Mr. A. B. Slater, and approved.

The annual report of the board of directors was then read by President Barstow, of which the following is a synopsis:

Gentlemen:—The Board of Directors beg to present to the Corporation their thirty-seventh annual report. While nothing of unusual interest has occurred in our operations during the year, we may safely congratulate ourselves and the Corporation not only on the fair measure of success attained in our general business, but also for that which has been reached in our efforts to so reorganize our works, by adopting such real improvements in the processes of manufacture, as shall place, or keep it, in the very front line of like organizations for economical and profitable operation.

In this, as in other manufacturing industries, we have fallen upon times of keen and sharp competition—upon times when none of these industries will prosper by accident; when success must be earned, if it be had, by intelligent and painstaking application; when the competition experienced by like corporations in neighboring or even distant cities must be accepted and treated as a menace to ourselves; and therefore, when the teachings of practical science in its application to any or all the branches of this art, though heard only in the distance, must be heeded and tested as a means of preparation for ever-threatening competition at our own doors. To this end, the plan of reorganizing and greatly improving our stacks of retorts, as also the processes for condensing, scrubbing, and purifying our gas, commenced three years since, has been continued the past year, and is now completed at the west station and nearly completed at the south station.

The rearrangement of the exhausters and the small engines that drive them, as also of the condensers and scrubbers, at the south station, nearly corresponds with like changes at the west station, reported last year. When completed we shall be able to show an increased income from ammoniacal water, probably amounting to $2,000 or $2,500 annually, with a more economical and satisfactory operation in other respects. These changes at the south station have reference to economic use rather than enlargement, though the introduction of the Dieterich furnaces in the retort house has added at least one-third to its productive capacity. In order to make these changes, as also to replace the earthen tile on the roof of the retort house with a covering of slate, it was necessary to close operations at that station. The fires were therefore extinguished on the 1st of May, and as yet have not been relighted. At the time of closing we expected to start up again on Sept. 1; but a little delay in the delivery of a new condenser, ordered for that station, has postponed the time probably for two or three weeks.

For more than four months the entire city and its suburbs have been supplied with gas from the west station. This station could now be safely depended upon to supply the city all the year, save the long nights of December and January; and with a little increase of its capacity for distillation in the retort house could safely be depended upon for the whole year, always excepting some such exigency as this incident illustrates. When extensive repairs or changes are to be made, making the entire stoppage of the works for a week or more not merely a convenience, but a necessity, the advantage of a duplicate works is appreciated. While the capacity of our holders is greater than the average, we could hardly arrange to store more gas than would be required, even by very economic use, for three or four of the shortest nights of summer.

The only other unusual expense at the south station during the year was the dredging of our channel from the main channel of the river to the head of our dock, a distance of more than 800 feet, at a cost of about $3,000. This dredging gives us a depth of 16 feet of water at high tide, and a channel 80 feet wide. The cheapest freights for coal now offered contemplates transportation by large schooners and barges. To avail ourselves of these offers for our 30,000 tons of coal per annum we must afford wide and deep channels and deep water in the docks where we discharge.

The changes in our real estate for the year are as follows: We have sold to the Union Railroad Company our five lots, corner of Traverse and Pike streets, containing a large brick stable, carriage house, and storehouses, and also a wooden two-story tenement house, for the sum of $25,000; and to another party a small lot, 25 by 50 feet, corner of Traverse and Tockwotton streets, for $750. Both of these pieces of property belonged to our abandoned east station, the balance of which, embracing about 100,000 feet of land and some valuable buildings, is on the market.

We have made no additions to our landed estate the past year, but have erected a brick stable and carriage house, 80 by 80 feet, two stories, upon lots which we owned on the south side of Langley street, opposite our west station, at a cost of about $14,000. Such a change of location for our stables has seemed very desirable ever since we abandoned the east station. That station, when in use, being located away from tidewater, made great demand upon our heavy teams. This change of stable locates our teams half a mile nearer their present work.

Our production for the last year was 339,460,000 cubic feet—an increase of 15,713,000 cubic feet, or nearly 5 per cent., over the previous year, or of 63,000,000 cubic feet (equal to 25 per cent.) over the year ending July 1st, 1880.

Our receipts for residuals—coke, tar, and ammoniacal liquor—during the year reached the large sum of $51,396.92. This is $3,316.25 more than the receipts for the previous year, and is fully one-third of the entire cost of the coal consumed. Unless the price of coke shall be cheapened by the increased quantity we have for sale, we may hope to show still greater results in our next annual report from the sale of ammoniacal liquor saved at the south station as a result of present improvements.

The number of meters in use on July 1st last was 10,453—a gain of 172 during the year. Our price for gas has been materially reduced during the year. The present price to general consumers is $1.90 per thousand cubic feet, which will be reduced to $1.80 at the close of the present quarter, say on 1st of October next. Very large consumers justly have a considerable reduction from the price to general consumers, and the city of Providence has its supply for street illumination at the low price of $1.50 per thousand cubic feet. This low price is the result of an arrangement with the city to use 5-feet instead of 4-feet burners in all its street lanterns, which arrangement added about 8,000,000 feet to the annual consumption.

This reduction in price, however, is in harmony with the present policy of the Board, which, in its efforts by improved processes to reduce the cost of gas, contemplates a reduction of price to customers, and not an increase of dividends.

The stockholders have noticed—we trust with satisfaction—our change of policy in the payment of dividends. On the 1st of April last we commenced the payment of dividends quarterly, instead of semi-annually, and by remittance of checks through the post office, payable to the order of the stockholder, rather than at our office on his personal receipt. As we have nearly 900 stockholders, this change doubles what was before a very considerable labor for the office; but it was made in the interest of the stockholders, and believing it to be regarded by them as a great saving of time and trouble, we propose to continue the practice.

The length of main pipes in use, as reported a year since, was 139 miles, of which about 1¾ miles were laid by the Citizens Gas Light Company, being the main supply from the south station to Weybosset bridge, and from the retort house to the holders at that station. To this add 20,149 feet, or about 3¾ miles, laid the past year, making the length now in the ground and in use 142¾ miles. Of the pipe laid by the Citizens Gas Light Company we have taken up during the year 8,306 feet, or 1.57 miles, leaving still in the ground about 11 miles of pipe laid by that company, only 1¾ miles of which are in use.

Our contracts for coal this year cover 30,000 tons, at $4.25 per ton, delivered at our wharves. The coal is from the best American mines, and the purchase price is the best we ever made. About one-half the amount has been received, and the balance of orders will be delivered at our convenience between now and the coming spring, it being understood that we take in all we can before the winter.

As we are threatened with another assault by speculators from beyond our borders, we deem it best to present for your information a classified list of our stockholders, that all may know what classes of our citizens are most imperilled by these assaults.

From a careful examination of our list of stockholders on the 15th of August last, we present the following classification, with the number of shares held by each:

353 men hold	21,267	shares.
385 women hold	15,769	"
96 trustees, executors, and administrators of estates hold	8,081	"
13 guardians of minors hold	166	"
7 charitable institutions hold	307	"
29 savings and other banks and insurance companies hold	4,410	"
883 stockholders hold	50,000	shares.

By this classification it will be seen that we number among our stockholders 32 more women than men; that only a little more than four-tenths of our stock is held directly by men; that about one-half our stock is held by women, guardians of minor children, trustees, executors and administrators of estates, and charitable institutions; and if we add to this list that held by savings and other banks and insurance companies, a considerable part of whose deposits and stocks are made or held by women, or for account of women and children, we may justly claim that a majority of our

stock is owned by women and children. It is not a small compliment to the character and standing of this corporation that so large a portion of our stock—more than one-fourth—has been selected for the investment of trust funds by classes of men noted for their conservatism, who occupy the position of trustees, executors, administrators, guardians and managers of our benevolent and monied corporations; and a still larger amount in their own right by married and single women and widows, who, in their investments, usually seek the advice of their most discreet male friends. And this fact is the more impressive for the reason that they have not been attracted by large dividends. For twenty-five years of our history our dividends have averaged but eight per cent.; and for the other ten years, which were years of war, and the years of specie suspension and consequent inflation of all values, which followed the war, they were but ten per cent.—about the same that were made by our leading national banks.

It is true that we made other gains during the season of inflation, which have been absorbed in the improvement of our processes of manufacture, made necessary in order to secure the best results and the greatest economy—in the abandonment of our East Station from the same motives—in the purchase of our South Station from the Citizens' Gaslight Company, made necessary to prevent a competition that would have been ruinous to both, etc., etc. But even these hardly surpass the large additions made to their surplus by the national banks during that season of high prices and large incomes. Moreover, it has been well understood for years past that the making of large dividends was not and would not be a part of the policy of this company; that, reserving only a fair dividend for the stockholders, such as shall seem fair to wise men in view of the risky nature of the business, this company will give this community the advantage of its experience, enterprise and skill by such reduction of prices from time to time, as improved methods of manufacture and increased production will justify. Our stock, therefore, has no attractions for speculators, but only for those who are seeking safe and permanent investments. It is held not merely by our own citizens, but largely, as we have shown, by those classes of citizens who have special claims for protection against the deceptive and unwarranted assaults of foreign speculators. We freely admit that private interests, however sacred, must yield when the public good requires such sacrifice, but as freely assert that the public claim should be clearly established before the sacrifice is demanded.

Difficulties Experienced in Purification.

[At the late annual meeting of the North British Association of Gas Managers, Mr. A. M'Pherson, of Kirkcaldy, Scotland, read a more than ordinarily interesting paper on the above-named subject. The facts and figures presented by the author should be carefully examined, for precision and nicety mark the manner of their compilation. Our report of the same is taken from the London *Journal*.]

The circumstances which I am about to lay before you are, in my opinion, of so exceptional a nature that I feel justified in occupying a portion of your time in narrating them, so that I may have the benefit of the various opinions and experience of the members of the Association brought to bear upon them, in order, if possible, to elucidate what I honestly confess still remains to me somewhat of a mystery.

During the past winter I did not experience any difficulty in removing the sulphuretted hydrogen from our gas until the first week in January, when quite suddenly my purifiers commenced to foul more rapidly than usual—in fact, only purifying about one-half the quantity of gas they had been doing in December, when the make was considerably greater. This I at first attributed to some carelessness on the part of the workmen, and I at once set about trying to find out if such was the case. However, I could not discover anything to justify my suspicion; and after a careful personal superintendence of the preparation of the lime and filling of the purifiers, I was forced to the conclusion that the cause lay somewhere else. (I may inform you that my purifying plant consists of four purifiers, 17 feet by 12 feet inside measurement, worked by six four-way cocks in the usual way; and that I use lime solely for purification, having four trays in each purifier, with a 6-inch layer of lime on each, or 2 feet of lime in each purifier.) A little consideration convinced me that it could not be a leak from any of the valve cocks that was causing the trouble, or I should never have had a clean test from the gas as it entered the main leading to the gasholder; but to set at rest all doubts on this point I had the cocks taken out of their seats, and the whole of the bearings properly cleaned and well greased. As I anticipated, however, this did no good.

I next turned my attention to the lime, thinking it possible it might have depreciated in quality; and to test this I sent for some lime from another lime works, and had it prepared and put into the purifiers. But this likewise had no salutary effect. About this time I discovered that the covers of the purifiers were hot, and that the water in the lutes was raised to a considerable temperature, being more than tepid. This led me to the conclusion that the lime was not cold enough when put into the purifiers. Acting on this idea, I went over to Edinburgh and consulted Mr. R. Mitchell, who, on my acquainting him with the circumstances in which I was placed, at once most generously and promptly acceded to my request, and despatched to Kirkcaldy a number of wagon-loads of lime which had been slaked for a fortnight and was certainly quite cold. I had this absolutely cold lime put into my purifiers immediately on its arrival, and filled with it the successive purifiers as they became fouled. But this also was a failure; the heat continuing on the covers, and the water of the lutes still remaining hot. With regard to this heating, I may here remark that it was always the cover and water of the last, or clean, purifier that was at the highest temperature. I work three on and one off; and the gas passes from the top down through the lime. So that the heat was generated in the passing of the second purifier, and communicated to the cover and water in the lute of the third, or clean purifier.

I next turned my attention to the coals that were being used, and discovered that one kind of coal (a fresh supply of which I had obtained, and commenced to use at the new year, when this trouble began) had a large quantity of iron pyrites running through it in laminations of considerable thickness. I at once stopped the use of this coal; and knowing that my friend Mr. W. Mackenzie, of Dunfermline, was in the habit of using this coal, I wrote him to ascertain if he was doing so, and if he had any trouble with his purifiers. From his reply I found he was using this coal, and, like myself, had from the beginning of the year also experienced difficulty in purification, although to a more limited extent than myself.

I now concluded that I was on the proper track. However, although I had ceased to use this coal, there was no change for the better. I then determined on consulting Dr. Stevenson Macadam; and I requested him to visit and inspect the works. When he came I showed him the coal I suspected; and he at once expressed his conviction that it was highly charged with sulphur. He took away with him three pieces for the determination of the sulphur in them; and at the same time I gave him some bottles of crude gas taken at the inlet to the condenser, so as to determine the quantity of sulphur in it, in order that I might be able to settle at once whether or not the crude gas was supercharged with sulphur, and so reduce the difficulty to a definite point, and obtain a certain basis on which to proceed.

Dr. Macadam's report on the coal was as follows:

No. 1 Sample.	No. 2 Sample.	No. 3 Sample.
2.18 per cent.	1.68 per cent.	1.92 per cent. of sulphur.
or 48.83 pounds.	37.63 pounds.	43.01 pounds of sulphur per ton.

This was equal to an average of 43.16 pounds of sulphur per ton of coal. The gas he found to contain 16.56 grains of sulphuretted hydrogen per cubic foot, while samples of gas taken from a like position from two other large gas works he found to contain 8.37 and 8.49 grains respectively, or only about half the amount found in the crude gas taken from our works.

I had now, I thought, located the matter; but still, although not using this coal, there was no abatement of the trouble. Dr. Macadam was of opinion that this was owing to residual sulphur being left embedded in the thick tar of the hydraulic main, which was being volatilized, and so fouling the gas then being made. In consequence of this I had the hydraulic main, as well as the condensers, thoroughly cleaned and washed out with hot water. Still there was no improvement, but quite the reverse; the purifiers fouling more rapidly than ever. I thus had my suspicion aroused that some of the other coals I was using were also giving off an abnormal amount of sulphuretted hydrogen; and I resolved to find this out. I took a sample of each kind of coal I was using, and proceeded to Edinburgh; remaining with Dr. Macadam in his laboratory until he had determined the amount of sulphur in them. It was as follows (for obvious reasons I shall not give the names of the coals, but simply designate them by letters):

	Small Sample. Percentage of Sulphur.	Bulk Sample. Per entage of Sulphur.
A	1.54	2.36
B	2.28	2.64
C	0.32	0.31
D	0.22	0.29
E	1.42	1.14
F	1.32	0.98

The small sample, I may explain, was a piece broken off each block, and operated on in my presence; the bulk sample being the entire block pulverized, and a sample taken from it. This was done by Dr. Macadam to check the other tests. From this you will observe the percentage of sulphur in four out of the six coals was abnormally high; from 0.5 to 0.6 per cent. being considered about an average quantity. Two of the coals thus contained each about five times the usual amount, two about double, and two about half. On my return home I immediately stopped the use of the two coals which contained so high a percentage of sulphur, and confined myself to the use of the other four (thus getting about the average amount), but

without any immediate improvement; indeed, the purifier turned on the day succeeding my stoppage of these two coals only purified 120,000 cubic feet of gas, and gave a foul test in ten hours, when in ordinary circumstances it would have remained effective for at least five days.

I thought it had now certainly come to a crisis; and although I had, through all, succeeded in keeping the gas supplied to the consumers free from sulphuretted hydrogen, by having a large staff of laborers constantly preparing lime and emptying and recharging the purifiers, I gave up hope of being able to maintain a supply of pure gas. Luckily, however this was the turning point.

I may state that the temperature of the gas at the inlet to the purifiers ranged from 50° to 56° F., and at the outlet of the scrubber the gas did not give, on litmus paper, any indication of the presence of ammonia. In order to be certain that no ammonia was present I put some litmus in a Woulfe's bottle, added sufficient acid, and kept a stream of gas passing through it without getting the slightest trace of ammonia; thus showing that it was all removed, and that this was not causing the trouble.

I now resolved to ask some of my professional brethren to consult with me on the subject, in the hope that they might be able to assist me to overcome the difficulty, seeing that it still continued, notwithstanding I had ceased to use the coals found so foul. I accordingly asked Mr. T. Whinster, of Perth, and Mr. J. Hall, of St. Andrews, to visit me at Kirkcaldy for this purpose. This they at once agreed to do; and having explained the whole matter to them, and placed Dr. Macadam's reports before them and conducted them over the works, they (after a thorough inspection) told me they were afraid they could not be of any service to me, as they could not see anything wrong, and were of opinion that the trouble all proceeded from the sulphury coals. This I was convinced was the original cause of the difficulty; but why should it continue after I had ceased to use these coals?

I was myself of opinion that the gas was being fouled in its passage through the pipes between the hydraulic main and the purifiers, by deposited sulphur being picked up. One of the above-named gentlemen agreed with me in this, and the other differed; so I determined to have the point settled, as one of considerable importance, and worth being definitely ascertained. I accordingly had a bottle of gas taken from four different points of the works, and had the amount of sulphuretted hydrogen in each ascertained by Dr. Macadam, with the following results:

Gas taken from:—	Sulphuretted Hydrogen per Cubic Foot.
Hydraulic main	9.16 grains.
Inlet to condenser	10.74 "
Outlet of condenser	8.74 "
Inlet to purifiers	11.26 "

Those results are suggestive; and whilst, no doubt, variations will occur in the gas being evolved at any particular period, seeing the samples were all taken within fifteen minutes of the same time, I do not suppose these variations would account for such a difference as here occurs; for while the gas taken from the hydraulic main contained 9.16 grains, and had increased by 1½ grains before the inlet of the condenser was reached (the gas having to pass along about fifty yards of pipe between the hydraulic main and the inlet to the condenser), it lost two grains in its passage through the condenser, which I had had thoroughly cleaned out before this, and again became impregnated to the extent of 2½ grains in its passage through the scrubber—an Anderson brush. You will, however, note the very considerable fall in the amount of sulphuretted hydrogen in the gas at the inlet to the condenser as compared with the previous analysis—10.74 grains as against 16.56 grains, or a decrease of nearly 6 grains. This is quite in keeping with my experience; for after the purifier which only ran ten hours, we had a gradual improvement, the next one going twenty hours, the next forty-eight hours, the next sixty hours, and so on until we got back to our normal condition. But in the meantime I had thoroughly washed out all the pipes between the hydraulic main and the inlet to the purifiers, as well as removed and cleaned all the brushes of the scrubber.

Such was my experience in the matter of purification during the past winter; and in it I was not alone, for, besides Mr. Mackenzie, Mr. Blair, of East Wemyss (a village about six miles from Kirkcaldy), was also in the same position, and called on me to see what I would advise him to do. I ascertained the coals he was using, and in the light of the knowledge I had obtained from the analysis, I told him to cease working with the coal designated A, which was the only one we were both carbonizing, and was quite different from the one Mr. Mackenzie and myself were using in common. Mr. Blair did this, and in two days reported to me that his purifiers were running longer, and they continued to go on improving.

It is, in my opinion, evident from the quantity of sulphuretted hydrogen found in the crude gas, that the source of my trouble was in the coal. But then I had been using a considerable quantity of both A and B coal all through the winter and until the beginning of January, without any trouble; and yet, on ceasing to work these coals, and cleaning out the whole of our apparatus, the normal condition of things was regained.

I acquainted the different coalmasters with the circumstances; and one sent to Dr. Wallace a wagon-load of his coal, with the request that he would determine the amount of sulphur therein. The load represented sections of the six different faces from which the coal was cut, and Dr. Wallace found as follows:

The portion from face No. 1 contained 0.57 per cent. of sulphur.
" " 2 " 0.56 " "
" " 3 " 0.61 " "
" " 4 " 0.47 " "
" " 5 " 0.55 " "
" " 6 " 0.64 " "
or an average of 0.56 per cent.

This analysis was made in the beginning of March, and was the same kind of coal as that which I first suspected, and in which, in February, Dr. Macadam found two per cent. The coalmaster from whom coal A was obtained was also dissatisfied when I told him his coal was highly charged with sulphur; and he cut two blocks, representing the entire seam, from the two faces from which it was worked, and sent them to Dr. Macadam, to ascertain whether both of the faces were affected. They were found to contain 1.34 and 1.06 per cent. respectively. This was in March. In February Dr. Macadam found it to be 2.36 per cent. This coalmaster, being still dissatisfied, sent in April a wagon-load to Dr. Wallace for analysis; and he found it then to contain 0.7 per cent., while I (after promising the President to read this paper) sent two samples of the A coal to Mr. G. R. Hislop, of Paisley, to examine for sulphur. One of these samples was from coal delivered to us in February; the other from coal delivered in May. Mr. Hislop found one per cent. of sulphur in the former, but only 0.48 per cent. in the latter. The quantity of sulphur found in this coal at different periods is most instructive. Dr. Macadam, in February, found 2.36 per cent.; and in March, 1.20 per cent.; Dr. Wallace, in April, found 0.7 per cent.; and Mr. Hislop, in May, found 0.48 per cent. This would seem to point to a regular and gradual decrease in the quantity of sulphur, and would seem to indicate that at the new year the seam must have been in a very sulphury condition, and to be now going back to its normal state, as Mr. Tatlock, who analyzed it in 1875, found then only 0.13 per cent. Mr. Hislop's analysis of a sample of the coal which I first suspected, and in which Dr. Macadam found an average of two per cent., agreed with that made by Dr. Wallace of the six blocks from the six faces (0.56 per cent.); while in a sample of B that was received by us in May, Mr. Hislop found 0.28 per cent., whereas in February Dr. Macadam found it to contain 2.64 per cent.—showing a very marked decrease.

During the months of January and February, 1883, our manufacture of gas was 14,018,400 cubic feet, and we changed nine purifiers during that period. In the months of January and February, 1884, our manufacture of gas was 14,858,000 cubic feet, and we changed twenty-eight purifiers in the same time.

I have now placed before you the particulars of my difficulty, and would request all the members to give them their careful consideration, and favor me with a full and free discussion, stating their ideas frankly and without any reserve; and I hope, if any one ever had a similar experience, he will give us the benefit thereof, and how he succeeded in overcoming it. I would, however, desire to put before you what I deem to be the chief points of the case. First, then, I consider I am justified in saying that the primary cause of the trouble was the use of coals charged to an excessive degree with sulphur; and although some may, perhaps, say there was a mistake in the analysis of the coal, as Dr. Macadam's results were not corroborated by Dr. Wallace, how can you account for the gas containing nearly double the amount of sulphuretted hydrogen that was found in the gases taken from the other two gas works, unless you admit that the coals were highly charged with sulphur? At the same time I am anxious to learn whether any of you ever knew or heard of coals suddenly changing in composition, and becoming largely impregnated with sulphur. I have been making inquiry, and am informed, on pretty good authority, that where a "trouble" occurs in a seam it often becomes very sulphury. The variation of coal in this respect is strikingly illustrated in the case of the A coal, where, between February and May, the percentage fell from 2.36 to 0.48 per cent. Then Mr. Hislop's analysis of the February and May samples shows certainly not so great, but still a very considerable difference—1 and 0.48 per cent. But for these corroborative results, I might have inclined to the idea that the lime was too hot when put into the purifiers, which might also have accounted for the heat found therein. I am, however, much more inclined to attribute the heat generated in the purifiers to the result of the energetic chemical action caused by such a large quantity of sulphuretted hydrogen being thrown on the lime in a limited space of time; as it is well known that time is a most important factor in controlling the amount of effective action to be obtained from the lime, as is illustrated by the fact well known to us all, that we can purify more gas with the same quantity of lime in summer than in winter. I am also of opinion that the heat generated had the effect of decomposing

any carbon bisulphide in the gas, and thus increasing the amount of sulphuretted hydrogen. Another circumstance I noticed in connection with it was this: As you may suppose, in such a condition of matters, our testing was very frequent; and, although a clean test was obtained, if tried again within half an hour, the discoloration of the lead paper would be very intense; the fouling appearing to take place very suddenly, and not to come on gradually, as is usually the case. I am inclined also to attribute this to the heated state of the purifier; and it would seem to indicate that lime raised to a certain temperature loses, to a great extent, its affinity for sulphuretted hydrogen, and becomes inert as a purifying agent.

I must apologize for having occupied so much of your time, but trust you will excuse me for so doing, as I consider the circumstances being so exceptional (at least to me) warrant me in laying the matter before you, even at considerable length. I would also desire to thank Mr. Hislop for his kindness in analyzing the samples of coal, as this has enabled me to place the matter before you more fully than would otherwise have been possible.

Discussion.

The President invited discussion, not only on the part of gas managers, but also of their friends the coalmasters who were present. He hoped these would assure them that the difficulties referred to could only be the result of palpable carelessness at the pits, and not that gas managers were all subject to this kind of thing being thrown upon them at any moment without notice.

Mr. P. Watson (Stirling) said he had had experiences similar to those of Mr. M'Pherson on two occasions—the first about five or six years ago, and lasting four or five days; and the second about two years ago, and lasting something like a week. It all came right of its own accord. At Coatbridge, some fourteen years ago, Mr. Drummond had about a month of it; and it went gradually away. Neither Mr. Drummond nor he could trace the cause of it. He thought Mr. Drummond used about 50 tons of lime; and it came out of the purifiers about as fresh as it went in.

Mr. G. Boyd (Alloa) was very sorry to say that he had had too much experience of these difficulties, from what he believed to be a coal containing too much sulphur. They were afraid to test the gas. Mr. M'Pherson knew the trouble he had, and he fully sympathized with him. The gas was quite black after it passed through the three purifiers, and before it was slightly yellow.

Mr. W. Foulis (Glasgow) said that he understood Mr. M'Pherson had not made any differences in his purchases of coal. Mr. Watson said that in his case the lime came out as clean as it went in. He should rather attribute the result to some impurity in the lime.

Mr. M'Pherson said his lime was thoroughly impregnated with sulphates and carbonates.

Mr. W. Key (Tradeston, Glasgow) asked what was the temperature at the time. This was, he said, a matter which had annoyed a number of gas managers during the past year. Mr. M'Pherson stated that he had made the same quantity of gas as before.

Mr. M'Pherson—Not much more.

Mr. Key asked if he found the temperature as high as in the previous year.

Mr. M'Pherson—It ranged from 50° to 56° Fahr. (according to the temperature of the atmosphere) on entering the purifier.

Mr. Key said he was going to suggest that the whole cause of the difficulty was the exceptionally mild winter they had last year. He insisted on the necessity of gas managers providing arrangements, in the way of condensation, in the line which he had previously indicated; and of the manager having in his power the full control of raising and lowering the temperature at any time in the year. Mr. M'Pherson might dismiss from his mind everything connected with coal or coal pyrites as the cause of his trouble, because all the gas managers in the country had been using coal similar to this in previous years (and possibly he had also), without difficulty. He had had the same experience, but had been in the habit of keeping a record of the temperature of the atmosphere, which was usually 34° or 40°—very seldom above 45°. At the inlet of his purifiers it was 120°. But, independently of this, Mr. M'Pherson had found the clue himself in the last clause of his paper; and this was the temperature of the lime, caused by the chemical action going on from the high atmospheric temperature. It was, in his opinion, nothing else than the temperature of the lime which caused the difficulty. If they had a little patience, and let the purifiers cool down, the thing would come right. Allow the purifiers to cool down, and the foul gas would pass and the purifier clean itself out. He should say that the works that had been so troubled this last winter were works that were ripe for additions to their purifier and condenser arrangements so as to keep the gas all right in the very mildest of seasons.

Mr. W. Mackenzie (Dunfermline) said he should like to take exception to Mr. Key's remarks. He did not think atmospheric influences had anything to do in the matter. He thought most of the members had passed through as mild winters as the last, and yet had never experienced anything like these difficulties. His experience was of the same nature as Mr. M'Pherson's, though not to the same degree; and contrary to the very strong advice he had to discontinue using the coal, he had resolved, in order to ascertain accurately whether the coal was or was not the cause of the difficulty, to persist with it. He did so, and in the very same proportions; and, as some of the speakers had said, the matter wore off and cured itself. The cause was a matter somewhat of surmise. But, at the same time, he could not help feeling that the coal must really have improved in quality.

Mr. J. M'Crae (Dundee) said that, regarding the effect of atmospheric temperature on the percentage of sulphur, he did not think it formed an element in the difficulty. The difficulty, he thought, lay in the percentage of sulphur in the coal.

Mr. J. Hall (St. Andrews) said the meeting had to thank Mr. M'Pherson—first, for his very able paper; and, secondly, for the history he had given them of his difficulties. So far as Mr. Key's theory was concerned, Mr. M'Pherson, instead of getting into difficulties, should have been getting out of them; because the year was turned, and his make of gas was becoming less. He reasoned in this way about the difficulty: Mr. M'Pherson was using the same coal and lime in the same circumstances as the whole year through. He should have liked to know from the coalmasters present if there was any experience of coal changing in character in this way. He did not think, in the first instance, that the coal was the cause of the difficulty. It had occurred to him that there was something foul about the works, and that this was being picked up in the gas and discovered in the purifiers. He certainly had thought that the lime Mr. M'Pherson was using was too hot, though not that it was in such a state as to cause the difficulty under which he labored. At the same time, he thought the evil had been gathering previously, and had "come to a head" at this time. This made him suggest to Mr. M'Pherson that it was possible that, from the hydraulic main forward, there might be sulphur, in some form or other, left in the vessels, and causing the foulness of which he complained. This, they would see, was a conclusion borne out by Mr. M'Pherson's actions under the advice of Dr. Macadam. At the hydraulic main he had a certain percentage of sulphur, and at the inlet to the purifiers it had increased; showing that there was a percentage of sulphur being picked up and carried forward. All the lime with which he filled his purifiers was being destroyed by the foulness of which he complained. Hence, the lessons he would draw were these: The first cause of Mr. M'Pherson's difficulty was his coal—the fresh coal received into his works had changed during the working. Whenever he gave up using these coals things became slightly better; but he was not free from all difficulty until he had his apparatus properly cleansed. Therefore, he (Mr. Hall) would advise managers, first, to look out carefully as to the coals they bought; secondly, to be sure that they had them when they did buy them; and, thirdly, to see that their apparatus was properly cleaned.

Mr. J. Hislop (Maryhill) said he had several times had the experience of Mr. M'Pherson. There had been a good deal said as to the difficulty and its cause, but nothing at all as to the remedy. He did not mean to enter into the cause; but it was not temperature, because he had means of condensing which he could regulate to any temperature. He had had experience of the difficulty for some weeks in January, 1883, and had tried everything, even cooling the tops of the purifier covers with a spray of water. But the only remedy he found was using the lime perfectly cold, and as dry as flour. This within two days reduced him to the normal condition of working.

Mr. A. Smith (Aberdeen) said this epidemic seemed to have been met with within a small circle, and it would be interesting to know, before they discussed the cause, what district the coal came from.

Mr. Hislop said he was always using the same coals, and there was no difference in them; and he was going back as far as twenty-five or twenty-six years.

Mr. Foulis said he understood Mr. M'Pherson to say that his lime was thoroughly impregnated with sulphur, showing that the purifier was doing its work.

Mr. M'Pherson—Yes.

Mr. Foulis said it must therefore have been the coal that was at fault; so that he thought all questions of temperature, etc., might be put aside.

Mr. J. C. Adamson (Airdrie) said that, looking at the samples of coal produced, it was evidently a coal from near a "trouble," if not from a "trouble" itself. It contained a large amount of sulphur, and it might have been producing very much less gas per ton, and therefore required a greater charge to keep up the supply. If so, this was a double cause for the difficulty.

Mr. H. Aitken (Falkirk) said that all coals varied, and were never quite alike in character. They varied from place to place, and in the section of the seam. That a "trouble" did usually produce more sulphur was quite true; and the extent of a "trouble" or hitch did not often limit itself to a few inches or a few feet, and that it had more sulphur in it than the rest of the seam they knew also to be a fact. He entirely agreed with the supposition that the coal was the "father and the mother" of this evil; and that it

might have been intensified by the rapid changing of the purifiers was, to his mind, also pretty clear. He thought it was a thousand pities that Mr. M'Pherson did not keep a sample of the coal which he sent to Mr. Macadam, and at once pack off a whole truck load of coals and analyze them in block; because there was nothing so unsatisfactory as analyzing one bit. They should be sent away in a five or ten ton quantity.

Mr. Hall, Jr. (St. Andrews) said the temperature on entering the apparatus was 50° or 56°. Did Mr. M'Pherson know what it was before and after his difficulties?

Mr. M'Pherson said always between 50° and 60°. He tried to keep it always about this, and never liked it to exceed 60°. In replying on the debate, he said most of the speakers had, he thought, answered each other. In regard to Mr. Key, he could not see what atmospheric temperature had to do with the difficulty at all. If he kept the temperature of the gas down to 50° or 60°, it was quite sufficient. If this was so, Mr. Key must agree with him that the heated state of the purifier was caused, not by the atmospheric temperature, but by the extra amount of sulphur thrown on the lime. He thought this more likely to be the correct solution, seeing that the temperature of the gas was reduced, he should say below what most managers would bring it down to. He did not think, either, that this was a sign that the works required extra condensing power, if they were able to reduce the temperature of the gas to this amount, even in such an abnormal winter as the last was. For, if they considered that they found sixteen grains of sulphuretted hydrogen per cubic foot in their gas as against only about eight grains in the gas of the Edinburgh and Edinburgh and Leith Companies, he thought this was a clear indication that the coal was the source from which the trouble emanated. He thought atmospheric temperature had very little to do with the matter.

Mr. Young (Bonnyrigg) wished to add a word as to an experience of this kind which occurred to him a great number of years ago. It was in association with a lot of material that came out of one of his coals. He threw into the retorts, with the coal, a quantity of the unfallen limestones that came out of the lime, and there was no difficulty after that.

The President thought the thanks of the meeting were due to Mr. M'Pherson for his paper.

Heating Bakers' Ovens by Gas.

One of the most interesting features in connection with the English International Health Exhibition was to be found in the department devoted to a practical illustration of the working of the baker's trade. Not the least important device shown in this particular section of the exhibition was the gas-heated baker's oven, developed and perfected by the efforts of Messrs. Booer and Gilson, the operation of which was made the subject of a most interesting paper read by the first-named gentleman at the last meeting of the Gas Institute, and reprinted in our issue for Aug. 16. It may be deemed quite fitting that Mr. Booer's invention should take a prominent place in a "health exhibition," as the success of any measure designed to do away with at least one contributory cause to the evil of atmospheric pollution must evidently be in accordance with the wishes of those who were the originators of the International Health Exhibition undertaking. Apart from the desire that must possess all inclined to assist in forwarding the very praiseworthy object of, as far as possible, abating the smoke nuisance, this subject has more than ordinary interest for the gas maker, inasmuch as it opens up an almost entirely new field for gas supply. The English technical papers, in their articles on the various sections of the exhibition, pay great attention to the Booer gas-heated oven, and seem to be inclined to the belief that the time is not far distant when solid fuel will be displaced by gaseous fuel under the oven of the baker.

The London *Builder*, in considering the subject of "The Bakeries at the Health Exhibition," notes that the principal exhibits give a fair idea of the internal economy of high-class bakeries, all the operations of making and baking bread being carried on in practical style, and indeed on a somewhat extensive scale. Each of the four principal establishments is fitted with an oven differing in essential features from those shown on the other stands, so that four distinct principles of baking are illustrated. The first exhibit that is met with on entering the east corridor is that of Mr. J. Marshall, of the Strand. The oven shown on this model establishment is one of great interest not only to bakers, but to the general public also, if only on account of the total abolition of smoke that undoubtedly attends its use. At the Smoke Abatement Exhibition Mr. Booer, the inventor, exhibited the first oven of this class, which took a gold medal. That now shown differs from the original in many respects, and is the result of the experience grained in actual work. The new arrangement has been patented by Messrs. Gilson & Booer, of 180 Union street, Southwark. The oven is similar in all respects to an ordinary baker's oven, with one important exception. In place of the usual coal fire there are a number of gas jets, which heat the brickwork in the same way that the flame from the coal does. The gas, however, creates no smoke, air being mixed with it previous to ignition in the Bunsen burner, and perfect combustion is thus produced. The arrangement of burners is such that the heat is distributed under the crown of the oven; the flame starting from the front angle on the right, passes toward the rear, and then back to the remaining angle or register corner.

The advantages claimed by the inventor for his system are numerous, and most of them will be apparent from the description given. For instance, there can be manifestly no smoke, that most fruitful source of trouble and anxiety to all bakers working in the ordinary way. It will also be evident that the space usually taken up by the storage of coal will be set free, probably to be occupied by another oven. The absence of the ash-pit is a greater advantage than at first sight might appear. In smaller and ill-regulated establishments, which are far more numerous than could be desired, the ash heap becomes a receptacle for refuse of all kinds, and frequently of matters of the most offensive description. When these are allowed to accumulate they give forth unpleasant odors, which are absorbed by the ferment or by the "sponge," which is a mixture of the ferment and flour. Although the condition of London bakehouses has greatly improved of late, much remains to be done in this direction; and, indeed, until a better class of journeymen can be trained, no possible amount of inspection will prevent dirty habits from being practiced, which have become ingrained by years of usage. Another point of advantage claimed by the advocates of this system is the uniform temperature at which the oven can be brought at each operation. About 500° F. is the best heat of oven for bread baking. If higher than this the oven will be "rash," and if lower it will be "slack." With the ordinary coal fire it is necessary to heat the oven a good deal above the temperature required for baking, as the process of "scuffling," or clearing away the soot and dirt, cools the brickwork considerably. For this reason, even supposing exactly the required heat to have been obtained at first, it is a matter of guesswork how far the temperature will be lowered by the scuffling. With gas the conditions are always the same, so long as the pressure in the mains and the quality of the gas remain constant; and it having once been ascertained how long it is necessary to keep the flame alight to get the required heat, it is easy to guard against undue ranges of temperature, and of course there is no scuffling.

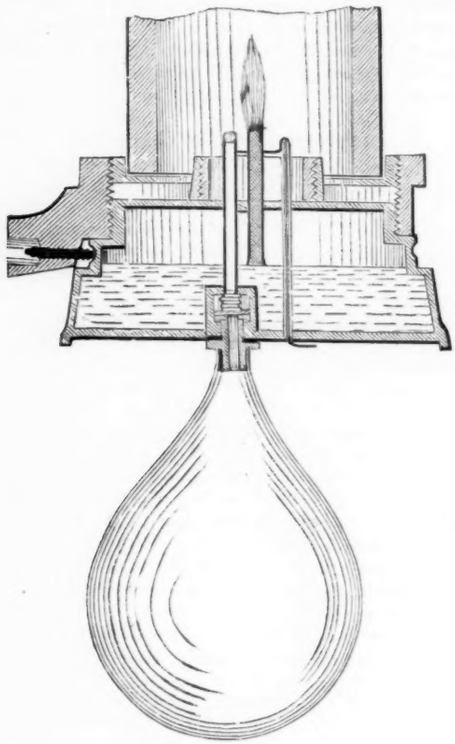
Probably the most promising feature in this invention is that it can be applied to the ordinary baker's oven at a comparatively small cost, and in the great majority of cases without interfering seriously with the ordinary routine of business. A short time ago Messrs. Gilson & Booer converted one of Messrs. Bertram & Roberts' ordinary ovens at the Crystal Palace into a gas oven in the space of twenty hours. The oven shown on Mr. Marshall's stand will hold ten bushels, equal to 320 half-quartern loaves. In London there are about 6,000 ovens such as this, excepting, of course, that they are worked with coal fires instead of gas. If all these were fitted on the principle we have described, it is estimated that they would burn 6,000,000 cubic feet of gas per day. The great advantage to the community that would arise from the freedom from smoke will be manifest. Although the Smoke Nuisance Act is occasionally put in force against bakers, its provisions are practically inoperative so far as abolishing the evils attendant on the use of coal in the ordinary baker's oven is concerned. Wood is the best fuel that can be used for baking, as it produces little smoke, and the products of combustion given off by it are not of an objectionable nature. In Continental cities wood is mainly used, but it is long since the London bakers gave up the cleaner and more wholesome fuel for coal. To Henry Sibthorpe belongs the credit, such as it is, of having introduced the reeking coal ovens of the London bakers. In 1635 he was granted a patent for "The arte & skill of erecting and makeing of ovens in such sorte as that the said bakers, baking cookes, and other persons may heate the same ovens with sea coales digged out of the earth, and therewith may bake assoone & as fayre & for lesse charge than they nowe dooe with wood, and with much more safety." Sibthorpe appears, however, to have had considerable difficulty in persuading the "bakers and bakeing cookes" to adopt his plan. The more extensive use of sea coal as fuel appears, however, to have been engaging the attention of the advanced spirits of that age, for the public records show that a large number of patents were granted about this time for different stoves and ovens in which coal was to be burned.

Whether the reign of smoke, so far as bakeries are concerned, will be brought to an end after lasting for 250 years by such inventions as those of Mr. Booer and others we are about to describe, remains to be seen. For the present by far the great majority of bakers use the ordinary smoky coal oven. Messrs. Marshall also use a patent gas-heated oven, exhibited in the same building by Messrs. Beynon & Cox, of Torquay. This oven is self-contained, requiring no brickwork setting. It is said to be remarkably economical, and seems especially well adapted for hotels, asylums, and other large establishments.

ELECTED.—Gen. James Jourdan has been elected President of the Fulton Municipal Gas Light Company, of Brooklyn, N. Y.

Improved Fire-Damp Detector.

According to the London *Mining Journal*, Mr. W. E. Garforth, of Normanton, has introduced an ingenious invention, the object of which is to detect fire-damp in collieries with the least possible degree of risk to those engaged in the work. Mr. Garforth's invention, which is illustrated in the diagram given below, consists in the use of a small india rubber hand ball, without a valve of any description, but by the ordinary action of compressing the ball, and then allowing it to expand, a sample of the suspected atmosphere is drawn from the roof, or any part of the mine, without the great risk which now attends the operation of testing for gas should the gauze of the lamp be defective. The sample thus obtained is then forced through a small protected tube on to the flame, when if gas is present it is shown by the well-known blue cap and elongated flame. From this description, and from the fact that the ball is so small that it can be carried in the coat pocket, or, if



necessary, in the waistcoat pocket, it will be apparent what a valuable adjunct Mr. Garforth's invention will prove to the safety-lamp. It has been supposed by some persons that explosions have been caused by the fire-trier himself, but owing to his own death in most cases the cause has remained undiscovered. This danger will now be altogether avoided. It is well known that the favorite form of lamp with the firemen is the Davy, because it shows more readily the presence of small quantities of gas; but the Davy was some years ago condemned, and is now strictly prohibited in all Belgian and many English mines. Recent experience, gained by repeated experiments with costly apparatus, has resulted in not only proving the Davy and some other descriptions of lamps to be unsafe, but some of our Government Inspectors and our most experienced mining engineers go so far as to say that "no lamp in a strong current of explosive gas is safe unless protected by a tin shield." If such is the case Mr. Garforth seems to have struck the key-note when, in the recent paper read before the Midland Institute of Mining and Civil Engineers, and which we have now before us, he says: "It would seem from the foregoing remarks that in any existing safety-lamp where one qualification is increased another is proportionately reduced; so it is doubtful whether all the necessary requirements of sensitiveness, resistance to strong currents, satisfactory light, self-extinction, perfect combustion, etc., can ever be combined in one lamp."

The nearest approach to Mr. Garforth's invention which we have ever heard of is that of a workman at a colliery in the North of England, who, more than 20 years ago, to avoid the trouble of getting to the highest part of the roof, used a kind of air pump, 7 or 8 feet long, to extract the gas from the breaks; and some five years ago Mr. Jones, of Ebbw Vale, had a similar idea. It appears that these appliances were so cumbersome, besides requiring too great length or height for most mines, and necessitating the use of both hands, that they did not come into general use. The ideas, however, are totally different, and the causes which have most likely led to the invention of the ball and protected tube were probably never thought of until recently; indeed, Mr. Garforth writes that he has only learnt about them since his paper was read before the Midland Institute, and some weeks after his patent was taken out.

No one, says Mr. Garforth, in his paper read before the Midland Institute, will, I presume, deny that the Davy is more sensitive than the tin shield lamp, inasmuch as in the former the surrounding atmosphere or explosive mixture has only one thickness of gauze to pass through, and that on a level with the flame; whilst the latter has a number of small holes and two or three thicknesses of gauze (according to the construction of the lamp), which the gas must penetrate before it reaches the flame. Moreover, the tin shield lamp, when inclined to one side, is extinguished (though not so easily as the Mueseler); and as the inlet holes are 6 inches from the top, it does not show a thin stratum of fire-damp near the roof as perceptibly as the Davy, which admits of being put in almost a horizontal position. Although the Davy lamp was, nearly fifty years ago, pronounced unsafe, by reason of its inability to resist an ordinary velocity of 8 feet per second, yet it is still kept in use on account of its sensitiveness. Its advocates maintain that a mine can be kept safer by using the Davy, which detects small quantities of gas, and thereby shows the real state of the mine, than by a lamp which, though able to resist a greater velocity, is not so sensitive, and consequently is apt to deceive. Assuming the Davy lamp to be condemned (as it has already been in Belgium and in some English mines), the Stephenson and some of the more recently invented lamps pronounced unsafe, then if greater shielding is recommended the question is, What means have we for detecting small quantities of fire-damp? It would seem from the foregoing remarks that in any existing safety-lamp, where one qualification is increased another is proportionately reduced; so it is doubtful whether all the necessary requirements of sensitiveness, resistance to strong currents, satisfactory light, self-extinction, perfect combustion, etc., can ever be combined in one lamp. The object of the present paper is to show that with the assistance of the fire-damp detector the tin shield, or any other description of lamp, is made as sensitive as the Davy, whilst its other advantages of resisting velocity, etc., are not in any way interfered with. As a proof of this I may mention that a deputy of experience recently visited a working place to make his inspection. He reported the stall to be free from gas, but when the manager and steward visited it with the detector, which they applied to the roof (where it would have been difficult to put even a small Davy), it drew a sample of the atmosphere which, on being put to the test tube in the tin shield lamp, at once showed the presence of fire-damp. Out of 28 tests in a mine working a long-wall face the Davy showed gas only 11 times, whilst the detector showed it in every case. The detector, as will be perceived from the one exhibited, and the accompanying sectional drawing, consists simply of an oval-shaped india rubber ball, fitted with a mouthpiece. The diameter is about 2¼ inches by 3 inches, its weight is 2 ounces, and it is so small that it can be carried without any inconvenience in the coat or even in the waistcoat pocket. Its capacity is such that all the air within it may be expelled by the compression of one hand. The mouthpiece is made to fit a tube in the bottom of the lamp, and when pressed against the india rubber ring on the ball-flange, a perfectly tight joint is made, which prevents the admission of any external air. The tube in the bottom of the lamp is carried within a short distance of the height of the wick-holder. It is covered at the upper end with gauze, besides being fitted with other thicknesses of gauze at certain distances within the tube; and if it be found desirable to further protect the flame against strong currents of air, a small valve may be placed at the inlet, as shown in the drawing. This valve is made of sufficient weight to resist the force of a strong current, and is only lifted from its seat by the pressure of the hand on the mouthpiece. It will be apparent from the small size and elasticity of the detector that the test can easily be made with one hand, and when the ball is allowed to expand a vacuum is formed within it, and a sample of the atmosphere drawn from the breaks, cavities, or highest parts of the roof, or, of course, any portion of the mine. When the sample is forced through the tube near the flame, gas, if present, at once reveals itself by the elongation of the flame in the usual way, at the same time giving an additional proof by burning with a blue flame on the top of the test tube. If gas is not present, the distinction is easily seen by the flame keeping the same size, but burning with somewhat greater brightness, owing to the increased quantity of oxygen forced upon it.

I venture to claim for this method of detecting fire-damp the following amongst other advantages: 1. The detector, on account of its size, can be placed in a break in the roof where an ordinary lamp—even a small Davy—could not be put, and a purer sample of the suspected atmosphere is obtained than would be the case even a few inches below the level of the roof. 2. The obtaining and testing of a sample in the manner above described takes away the possibility of an explosion, which might be the result if a lamp with a defective gauze were placed in an explosive atmosphere. No

one knows how many explosions have not been caused by the fire-trier himself. This will now be avoided. (Although lamps fitted with a tin shield will be subjected to the same strict examination as hitherto, still they do not admit of the same frequent inspection as those without shields, for in the latter case each workman can examine his own lamp as an extra precaution; whereas the examination of the tin shield lamps will rest entirely with the lamp-man). 3. The lamp can be kept in a pure atmosphere whilst the sample is obtained by the detector, and at a greater height than the flame in a safety-lamp could be properly distinguished. The test can afterward be made in a safe place, at some distance from the explosive atmosphere; and, owing to the vacuum formed, the ball (without closing the mouthpiece) has been carried a mile or more without the gas escaping. 4. The detector supplies a better knowledge of the condition of the working places, especially in breaks and cavities in the roof; which latter, with the help of a nozzle and staff, may be reached to a height of 10 feet or more, by the detector being pressed against the roof and sides, or by the use of a special form of detector. 5. Being able at will to force the contents of the detector on to the flame, the effects of an explosion inside the lamp need not be feared. (This danger being removed, admits, I think, of the glass cylinder being made of a larger diameter, whereby a better light is obtained; it may also be considered quite as strong, when used with the detector, as a lamp of a small diameter, when the latter is placed in an explosive atmosphere.) 6. The use of the detector will permit the further protection of the present tin shield lamp, by an extra thickness of gauze, if such addition is found advantageous in resisting an increased velocity. 7. In the Mueseler, Stephenson, and other lamps, where the flame is surrounded by glass, there is no means of using the wire for shot firing. The detector tube, although protected by two thicknesses of gauze, admits of this being done by the use of a special form of valve turned by the mouthpiece of the detector. (The system of firing shots or using open lamps in the same pit where safety lamps are used is exceedingly objectionable; still, under certain conditions, shots may be fired without danger. Whether safety-lamps or candles are used, it is thought the use of the detector will afford such a ready means of testing that more examinations will be made before firing a shot, thereby insuring greater safety. 8. In testing for gas with a safety-lamp there is a fear of the light being extinguished, when the lamp is suddenly placed in a quantity of gas, or in endeavoring to get a very small light; this is especially the case with some kinds of lamps. With the detector this is avoided, as a large flame can be used, which is considered by some a preferable means of testing for small quantities; and the test can be made without risk. Where gas is present in large quantities the blue flame at the end of the test tube will be found a further proof. This latter result is produced by the slightest compression of the ball. (I need not point out the inconvenience and loss of time in having to travel a mile or more to relight.) As regards the use of the detector with open lights, several of the foregoing advantages or modifications of them will apply. Instead of having to use the safety-lamp as at present, it is thought that the working place will be more frequently examined, for a sample of the suspected atmosphere can be carried to a safe place and forced on to the naked light, when, if gas be present, it simply burns at the end of the mouthpiece like an ordinary gas jet. There are other advantages, such as examining the return airways without exposing the lamp, etc., which will be apparent, and become of more or less importance according to the conditions under which the tests are made.

In conclusion, I wish to point out that the practice adopted at some collieries, of having all the men supplied with the most approved lamp (such as the Mueseler or tin shield lamp) is not a safe one. If the strength of a chain is only equal to the weakest link, it may be argued that the safety of a mine is only equal to that of the most careless man, or most unsafe lamp, in it. If, therefore, the deputies, whose duty it is to look for gas and travel the most dangerous parts of the mine, are obliged to use the Davy on account of its sensitiveness, may it not be said that, as their lamps are exposed equally with the workmen's to the high velocities of air, they are the weak links in the safety of the mine? For the reasons given, I venture to submit that the difficulties and dangers I have mentioned will be largely reduced, if not wholly overcome, by the use of the fire-damp detector.

Ventilation of Coal Cargoes.

The Committee of Lloyds (England) have received from the Board of Trade a report concerning the surface ventilation of a cargo of 2,050 tons of coal carried in the vessel Sutherlandshire, while making the voyage from Hull (England) to San Francisco (U. S.) in the year 1883. From this report it appears that great advantages were gained from following out a certain system of tubes inserted at different points in the cargo, whereby the sailing master was enabled to ascertain the temperature prevailing in the interior of the coal mass. The tube system was carried out under instructions given in the report of the Royal Commission appointed to inquire into the causes (as also to point out the best means of preventing) leading to the spontaneous combustion of coal while in transit in ships. This same vessel has left Hull for San Francisco, loaded with soft coal (as on her previously mentioned voyage), and equipped in similar fashion. Her commander, Captain Inglis, thoroughly approves of the tube system, and will continue his daily temperature chart record.

It is stated that, while the Sutherlandshire was at San Francisco, three coal laden vessels arrived on fire, and that one of them, an American ship, had been on fire fifty-three days. When detained, the Sutherlandshire was fitted with a box ventilator on each hatch, viz., fore, main and aft, passing down through the body of the coals. There was also one 14-inch iron cowl ventilator passing through the forecastle and main decks, one trunk ventilator, with skylight top, leading through midship house and main deck, one 18-inch iron cowl abaft mainmast leading to the water tanks, and two 12-inch cowls through poop and main decks to store-room right aft. The alterations made were as follows: The two aft ventilators were boxed, and continued through the store-room deck to the cargo. The tank ventilator was opened out to the cargo at the main deck, and the trunk and forecastle ventilators were accepted (being suitable for surface ventilation). The three wood box ventilators in the hatchways were removed, and testing pipes put in their places.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Annual Election of the Providence (R. I.) Gas Light Company.—The annual meeting of the stockholders of the Providence Gas Light Company was held at the office of the corporation, on Monday, September 1st. When the annual report was read, the election for directors for the ensuing year resulted in the choice of Messrs. Wm. Goddard, Amos C. Barstow, A. B. Slater, Royal C. Taft, Jesse Metcalf, Amos N. Beckwith, Edward Pearce, G. W. R. Matteson and Lucien Sharpe. At the subsequent meeting of the Directors, organization was perfected by the election of officers in the persons of Messrs. Amos C. Barstow, president; Wm. Goddard, vice-president; A B. Slater, Secretary and Treasurer.

Fifty-Third Exhibit of the American Institute.—The fifty-third exhibition of the American Institute will be opened on date of Wednesday, September 24th, in the Institute building, corner of Third avenue and 63d street, New York city. It is stated that the applications for space from intending exhibitors far exceed in number those made in any previous year. No allotment of places or position has yet been decided upon, as the time for closing the reception of entries was not reached until Saturday, September 13th. Still, this leaves sufficient time for such adjustment. The Institute building has been thoroughly overhauled, renovated and decorated, and visitors will no doubt be surprised and pleased at the changes that have taken place. Gas men are always sure of finding something worth inspecting among the multitude of objects displayed; therefore we would recommend those of the fraternity visiting New York city during the time the Institute remains open the wisdom of "calling in" at the Fair.

New Patent Gas Tubing.—Mr. T. Fletcher, of Warrington, England, whose name is well known to the American gas maker, has recently patented a method for the manufacture of gas tubing. In speaking on the subject, Mr. Warrington says:—"An elastic rubber tubing, perfectly gas-tight and free from smell, has been urgently needed for many years; in fact, the impossibility of making satisfactory connections, for gas apparatus which requires to be movable, has rendered the use of gas as a fuel in many cases a most objectionable nuisance. The tubing recently patented is made of two layers of vulcanized rubber, with pure, soft tin foil between them. It is perfectly and permanently gas-tight and free from smell under all circumstances, while it retains, sufficiently for all purposes, the flexibility and elasticity of an ordinary rubber tube. The braided or cloth covered tube which has been made with the intention of filling this want, has never come into general use, owing to the very small quantity of gas it will pass, rendering it almost useless for anything except small lighting burners, and also because special brass connections and screws have to be fitted to every burner and to both ends of every length of tube. Both these serious faults are done away with, and the result now obtained fills a most urgent want, which every maker and user of gas apparatus must feel almost daily. Irrespective of the known fact that extremely thin layers of rolled or beaten tin are perfectly gas-tight, this tube has been thoroughly tested for months under continuous heavy pressures of gas." The material is furnished in lengths running from two to six feet, with three-eighths and one-half inch bore in the clear.

Dangers of the Electric Current.—At an early hour on the morning of September first, one of the electric lights on the south roadway of the great bridge spanning the East River needed fixing, and a new man in the employ of the United States Electric Illuminating Company was ordered to

make the adjustment. The new hand experienced difficulty in accomplishing the operation, and John Hacker, one of the company's trusted men, climbed the pole in order to assist his fellow workman. Hacker had just reached the light when he received an electric shock of such violence that he was thrown from the pole, falling on his head on the stone roadway some thirty feet below. Bridge Policemen Fitzgibbons and Campion, attracted by the cries of Hacker's assistant, rushed to the spot and found the unfortunate workman lying insensible on the pavement, with a flow of blood oozing from an ugly wound in his head. The surgeon in charge of the Chambers Street Hospital, to which the sufferer was immediately conveyed, said the injured man could not survive. The man who first attempted to fix the light was in a position on the mast above Hacker, had hold of the cross-bar, and did not feel the slightest symptoms of the shock that knocked his companion down. When reaching the roadway safe and sound, the new employee said he was done with that business forever.

Growth of Gas Supply in Paris, France.—A comparison of the money value of quantities of gas supplied for lighting and heating purposes by the Paris Gas Company, for the first six months of years 1883 and 1884, shows that 1884 leads it predecessor by the sum of $201,375—or a percentage equivalent to 2.89.

Tapping a Water Main.—The gas companies of New York city are not the only sufferers from the careless and slovenly manner in which digging operations are carried on in the streets of the metropolis. On Saturday, September 6th, a laborer while engaged in making an excavation for the reception of a hydrant in front of the premises No. 15 South Fifth avenue, struck the water main with a crowbar with such force that the conduit burst, and the people of the vicinity were treated to the unusual sight of a veritable water spout. If the annoyance had ended with a temporary flooding of the cellars in the neighborhood it would, perhaps, not have been so bad; but when the water was shut off for some two or three hours, in order to allow of repairs being made, it is easy to guess how aggravating the situation was, and to what vexation people drawing their water supply from that particular main were put to, and all because of the gross negligence of one of the city's "horny-handed sons of toil."

Admitted to Partnership.—Mr. William Gardner, manufacturer of all kinds of fire clay goods, at Pittsburgh, Pa., has made a change in his business relations by the admission of his son to a partnership in the firm. The title of the firm will hereafter be that of William Gardner & Son.

Helping Out the Electric Light in a Theater with Oil Lamps.—The owners of the Third Avenue Theatre in New York city have had a rather unpleasant experience with the electric lighting methods instituted there some time ago. Regular patrons of the place who have attended any of the performances since the opening night of this season (Saturday, Aug. 30,) say that the lighting reminded them of the ancient times when Burton's and the Old Bowery playhouses were illuminated with smoky oil lamps. Mr. Jos. Arthur, the manager of the Third Avenue Theater, recently speaking with a *Times* reporter on the failure of the electric light to brighten the house up, said: "I never saw such a complete failure in my life. Last season, when electric lights threatened to supersede all other means of illumination, Mr. Rankin was induced to put the Brush system of lighting in this theater. Gas was banished altogether, and the electric lights were placed on the stage, in the borders, and wherever, under ordinary circumstances, gas jets would be used. Curtis and Stevenson, who then had the house, made an agreement with the Brush Electric Light Company by which, in consideration of payment of the sum of $100 per week, the theater was to be lighted by that company's system. Curtis and Stevenson complied with the terms of the contract up to about two or three weeks before they closed their engagement, and, I believe, left the city without having entirely completed the payments to the electric company. When Mr. Rankin opened the house this season we made a verbal contract with Mr. Magrath, of the Brush Company, whereby we were to get the electric light on the same terms as those formerly made with Curtis and Stevenson. Everything being settled, the opening night came along, and the light was pretty bad; but on Monday, Sept. 1, it was simply dreadful. The body of the house was in a state of gloom, and on the stage the actors could not distinguish each other's features. On the following Tuesday I sent invitations to the officers of the Brush Electric Light Company to witness the performance. Several of them were there, and the light was abominably bad. In order to satisfy the audience that we were not at fault, I went before the curtain and made a statement. Then I went to a neighboring lamp store and bought half a dozen coal oil reflectors; these we placed about the stage, and improved matters a little for that performance. I now have made arrangements to light the house with calcium lights." The proprietor of the Third Avenue Theater would have had no bother from light failures did he but persist in keeping on with the "light of the present" instead of experimenting with the "light of the future." We have repeatedly heard of the glowing and great successes achieved in the lighting of foreign theaters with the electric current, but have no knowledge of the case of a playhouse in this country where electricity, unaided by gas or other illuminative assistants, has proved entirely acceptable.

Inhaling Illuminating Gas with Suicidal Intent.—Charles S. Hill, cashier of the National Bank of New Brunswick, N. J., and County Clerk of Middlesex county, was found dead in his bed at his residence, No. 71 Albany street, in the above named city, on the morning of Thursday, September 4th. A domestic named Mary Murphy, attached to the Hill household, went to wake her employer, as he did not make his appearance at the usual breakfast hour. She knocked at the door of his room, but received no response, and perceiving a strong smell of escaping gas, became alarmed. Her cries brought to her aid a carpenter who was engaged in making some repairs on the premises, and together they entered Mr. Hill's sleeping apartment, the door of which was unlocked. The occupant of the room was found insensible. They immediately summoned a physician, who, after a hasty examination, decided that life had been extinct for some hours. An examination of the premises showed that Mr. Hill's bedroom was connected with another apartment used, as the servants explained, as a sewing-room, and further on was a bathroom—the three rooms could be all thrown into one by opening the doors separating them. It was noticed that the connecting doors were open, that all the windows were tightly shut, the two gas burners in the bedroom, one burner in the sewing-room, as also one in the bathroom, were all fully turned on. Despite the appearance of everything connected with the case, the first telegraphic reports received at New York contained the statement that suicide was not the cause of Hill's death. The whole thing was made clear the next day or two when it was found that the accounts of the New Brunswick National Bank were in great confusion, and that a defalcation involving a large amount of money had been discovered.

James McManes Reappointed.—James McManes, who about one and a half years ago failed of being re elected as a member of the Board of Trustees of the Philadelphia Gas Trust, was appointed to the vacancy in that body, recently caused through the death of one of its members, by a vote of the Select council, at a meeting held on Thursday, September 5th. McManes is now engaged in defending a civil action brought against him by the city of Philadelphia, Pa., in regard to certain matters connected with his former course while serving as a Gas Trust official.

Ordering the Wires Underground.—Philadelphia, Pa., was one of the first cities in the United States to consider the ways and means of ridding her streets from the unsightly poles carrying electric conductors, the planting of which had actually reached the proportions of a public nuisance. After much agitation of the question it was finally determined that the poles would have to come down, and the wires be carried underground. On September 9th, Mr. David R. Walker, chief of the Philadelphia City Electrical Department, sent a notice to all the companies concerned requiring them to comply with the ordinance, passed by the city Councils, which orders the removal of all telegraph, telephone and electric light poles and wires from over, along and across the streets of the city of Philadelphia, prior to the first day of January, 1885.

Does the Standard Oil Company Own the Streets of Long Island City?—There is some doubt in the minds of the taxpayers of Long Island City (formerly known as Hunter's Point) as to whether the Standard Oil Company owns the place or not. Certain it is that the great "oil whale" does pretty much about as it pleases there, and continues to act as though it, at least, had no doubt as to whom the rightful ownership of the territory is vested in. Indeed the great oil refining syndicate is not satisfied with doing exactly what it pleases with the soil surface, but has taken possession of the underground sewer arrangements (although this usurpation may be put down as an involuntary one), and everybody knows, who has visited the region, that the atmosphere over the place entirely belongs to the rapacious monster. New Yorkers know this to be so from the fact that an easterly wind always conveys an intimation of odors other than those which we are told prevail in some Oriental countries. No amount of agitation anent the question has succeeded in even allaying this nuisance; but an end will surely be put to it some time or another. The latest eccentricity connected with the Standard's refineries at Long Island City cropped out on Sunday evening, September 7th. At about eleven o'clock on the evening of that date, people living in the vicinity of Vernon avenue and Tenth street were startled by an explosion that shook their houses up and disturbed things more or less. At first some thought that the symptoms pointed to another earthquake shock, while others were inclined to the belief that it was merely the regular monthly explosion with which the Standard folks are wont to enliven the dullness of the locality. Investigation demonstrated that it was but a new form of surprise devised by the Standard concern, and partook of the

nature of an explosion caused by allowing naphtha to flow into the city sewer main from some portion of the Standard's works. A sewer man-hole head at the corner of Vernon avenue and Tenth street was blown up to a height of some fifty feet, and in its descent passed through the roof of a passing street car, severely injuring a passenger, who is the daughter of Alderman Morris, of Astoria. Andrew Henderson, residing on Tenth street, just below Vernon avenue, took a lamp along with him into his cellar for the purpose of ascertaining whether any damage had been occasioned to the liquor casks there stored away (Henderson keeps a saloon on the premises), and just as he had reached the bottom of the staircase a second explosion occurred from contact of the lamplight with the explosive naphtha mixture that filled the place. He was horribly burned about the face and head, and Dr. Dennler says it is a wonder that the sufferer was not killed. Mr. Henderson, through his counsel, Mr. G. W. Walker, has commenced an action against the Standard Company for damages in the amount of $10,000. Dr. Dennler, who is health officer for Long Island City, says that the local Board of Health has repeatedly called the attention of the Standard Company to the dangers arising from negligence in allowing naphtha and crude oil to flow into the sewers of the city; but having received no attention from the refinery people in regard to a stoppage of the evil, will now apply to Governor Cleveland to take cognizance of the subject.

The Boston (Mass.) Opposition Applicants Granted "Leave to Withdraw."—The year 1884 has proven to be a very bad year for prophets, particularly for those prophets whose foreshadowings sprang from a desire to profit by the division of gas supply in certain large cities of this country. Positive claims were made early in the season that Boston would be enumerated among the places where coal gas would have to hide its abashed head; but, somehow or another, coal gas in Boston manages to keep rather well above the surface, and there is every likelihood of its being "allowed to remain." Everyone of course remembers the grand flourish made by the promoters of the Consumer's Gas Company when that "grand old organization" made application for a license to free Boston's citizens from the extortionists who had so long "ground them into the dust." Thousands of gas consumers hailed their entry into the city with the loudest of joyful acclamations, at least so Messrs. Pierson and his associates claimed; but the thousands of "eager citizens" appear to have allowed their enthusiasm to die out after the initial enthusiastic outburst. Well, as a matter of course, even the application of such doughty gentlemen as those in charge of the Consumer's Gas Company had to follow the usual course, and was referred to the Aldermanic Committee on Paving, where the application or petition for leave to construct and operate a gas plant within the limits of the city of Boston would be considered on its merits. Investigation of the matter was duly and properly made, with the result that a majority of the committee of reference (Aldermen Slade and Hall), on date of September first, reported back to the full aldermanic body that they could not see their way clear to allowing the privileges asked for by the petitioners. The majority report finds that the chief promoters of the Consumers' Company are Messrs. M. S. Frost & Co., of New York, Mr. H. M. Pierson, of same city, together with several other gentlemen of good financial standing, who profess a willingness to embark their capital in the enterprise.

The Company was granted a charter from the State of Massachusetts on date of August 11, with a capital stock of $500,000, which it is proposed to divide into 5,000 shares, of which three Boston gentlemen have subscribed for 28 shares each. No one of the 3,000 gas consumers of the city of Boston, who signed their names to a petition asking for favorable recognition of the new company, appeared before the committee to show that they had any grievances against the corporations which at present supply the city of Boston with gas. The process proposed to be used by the new company has only been tested in the laboratory, and has never been used for commercial purposes. The company proposed to furnish gas for $1.35 per 1,000 cubic feet, and on time contracts for $1.25 per thousand. The committee has considered the advantages which the petitioners offer to the city and citizens of Boston in comparison with all the disadvantages and inconveniences which must inevitably arise from the preparation to begin business. So great an inconvenience as the opening of all the streets for the installation of a system of distributing conduits should not be permitted unless it is shown to be absolutely necessary. The petitioners utterly failed to show any public necessity for the granting of their petition. On the contrary, it appeared, from the statements of their own witnesses, that in Boston proper the price charged for gas is 75 cents per thousand less than it is in Brooklyn, where there are several companies; and it was further admitted that the history of competition in gas manufacture has ultimately and invariably resulted in combination and the charging of a higher rate. If the time ever arrives when a competing gas company is allowed to do business in Boston, it should be organized and conducted by those who have an interest in the city. The committee has come to the conclusion that the inconveniences and discomforts arising from the granting of this petition would be far greater to the citizens than would be the benefits derived from the offer which the petitioners make; that the Board of Aldermen has no right to grant permission to a company to do business under a process which has never passed beyond the stage of experiment, and is, therefore, of doubtful legality under the laws of the Commonwealth; that it is inexpedient to allow so great a privilege as is requested to be controlled by persons who have not the interest of citizenship in the city of Boston, and are simply engaged in the enterprise as a financial investment. The committee, therefore, recommends that the petitioners have leave to withdraw.

On behalf of himself, Alderman Fernald submitted a minority report. He admits that the present gas supply of the city has been shown to be good, but thinks they cannot do very much, if any, better under the processes of manufacture adopted by the existing companies, and is of the opinion that the citizens cannot now ask for a lower rate from the old corporations. He then tried to argue that this state of affairs gives a foundation and a reason for granting the petition of the Consumers Company. He says the petitioners have testified, and have established by satisfactory evidence, that by taking advantage of processes never before employed in the operation of gas manufacture in Boston they can supply a gas of 25 per cent. better quality than that now furnished, and at a price lower in rate by 15 cents per thousand cubic feet. He submits that the examination has sustained the following facts: 1st. The gentlemen composing the Consumers Gas Company are responsible and able business men of large experience and ample resources. Their record in various cities where they have constructed works is invariably of the highest order for fidelity of work, full performance of their promises and contracts, and fair dealing with the citizens. 2d. The company has ample capital to carry out its plans. 3d. The promises, both as to quality of product and price of supply, can be carried out, and afford the company such a living profit as will insure its independence and permanency. He concludes his argument by making a plea for competition in the gas business for the "benefit" of the citizens, and, in the end, recommends the passage of an order granting the prayer of the petitioners, under the usual restrictions. The majority and minority reports were ordered to be printed.

The Foreign Sulphate of Ammonia Market, August, 1884.—The monthly report of the English market for sulphate of ammonia values, published by Messrs. Bradbury & Hirsch, shows that but little fluctuation has marked the range of prices during the month of August last. The tone of the market was noticeably stronger, however, during the two last weeks, an advance of 10s. on parcels for delivery at Hull being recorded—£15 10s. being paid, and at the close £15 15s. was demanded. Messrs. Bradbury & Hirsch attribute the upward movement in part to enforced purchases for delivery on "short" contracts; the same authority inclines to the belief that the sulphate market for the near future will maintain the recent advance.

Raising the Candle Power.—The usual claim put forward by those interested in foisting the arc light upon a community for the illumination of its streets, is to estimate the lighting power of each arc as somewhere between one and two thousand candle power. It appears that as the electricians advance toward the setting sun the candle power estimate increases. News now comes to us that "the most powerful electric light on the Pacific coast, and one of the most powerful in the world, is about to be mounted on the summit of Telegraph Hill, San Francisco, Cal. It will be of 2,400 candle power, and a pole 100 feet in height has been put in position to carry it." San Francisco never does anything by halves.

Reduction in Price of Gas at Taunton, Mass.—Mr. Henry B. Leach, Agent and Superintendent of the Taunton Gas Light Company, has notified the gas consumers of his city that on and after October 1st the price of gas will be reduced to $2 per thousand cubic feet. Bills showing a quarterly consumption of 125,000 cubic feet or over are put down in the new schedule as entitled to a rebate of 25 cents per thousand, or a net price of $1.75. The Taunton Company offers to furnish service pipe, not to exceed 50 feet in length, free of cost, and also agrees to pipe houses at cost prices of material and labor. The circular announcing the reduction says: "With this low price for gas, we confidently look forward to a largely increased consumption; and if these anticipations prove well-founded the near future will see the promulgation of still cheaper prices." Keep up the good work, Mr. Leach.

A Bogus Collector.—Some few of the Harlem Gas Light Company's consumers have lately been defrauded out of certain sums of money through the swindling operations of a rascal who conceived the idea of personating as one of the Company's collectors. The swindler is quite likely to come to grief, as Mr. H. Osborn, Secretary of the Company, has been authorized to offer a reward for any information that will lead to an arrest and conviction. All the collectors of gas rates attached to the New York city companies are furnished with a written document certifying to their official connection or

capacity; but this medium of identification can hardly be looked upon as insuring safety. We think it would be a wise move were the New York companies to adopt the plan, inaugurated by the Philadelphia Gas Trust folks some time ago, of uniforming all those attaches whose duties compelled them to visit the interior of consumers' dwellings. It cannot be urged that the requiring of wearing such uniforms would be in any sense prejudicial to the feelings of the employees; quite the contrary, such system could only inure to their benefit in this respect. At any rate, if the uniforming plan is considered in any way objectionable, an official badge worn conspicuously ought to be insisted upon.

INCLINED TO DOUBT.—The *National Car Builder* is inclined to doubt whether the electric light can be successfully applied to the lighting of railway coaches.

Correspondence

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

"Expert" Testimony.

NEW YORK CITY, Sept. 5, 1884.

To the Editor AMERICAN GAS LIGHT JOURNAL:

Since the August 2d issue of the JOURNAL, containing an account of an explosion of water gas that occurred in the city of Atlanta, Ga., while plumbers were engaged in making a connection between the main pipes of the Gate City Gas Light Company and the premises of Mr. C. M. Barry, a groceryman, doing business at No. 172 Decatur street, in the city above mentioned, I have seen the evidence given before the coroner's jury as sworn to by "Engineer" Holmes and assistants. I enclose a copy, which you will find to be at least amusing (even if it is not instructive) reading. Mr. Holmes's testimony was as follows:

"F. S. Holmes sworn: Both coal gas and water gas explode—
Coal gas explodes, 1 gas to 7 air.
Water gas explodes, 1 gas to 4 air.

Both explode by heat and concussion. Absence of heat in this explosion indicates, to my mind, that there was no illuminating gas connected with it. No one was burned; neither the eyebrows nor hair of those in close proximity at the time, so far as we have evidence, were singed. The amount, either of coal or of water gas, required to cause an explosion violent enough to raise the roof of the structure, would have been more than was possible to get in to the space underneath the building. Absence of heat in this explosion would indicate the action of either one of two forces: first, dynamite; second, foul air, or carbonic acid gas—sometimes called 'well gas'—arising from sewers, etc. When this carbonic acid gas comes up through the earth without meeting any barrier to its escape, it passes harmlessly off through diffusion in the atmosphere; but when confined, as in this case, below the planking of a floor, without sufficient draft or free circulation of air to carry it off, it is one of the most powerful of known explosives. Its composition is exactly the same as 'fire-damp.' I came here and tested the pipes. Mr. Snyder, my assistant, informed me there had been an explosion on Decatur street which had destroyed a building, and also that there had been loss of life. Have been in the water gas business for ten years, starting new companies. Upon receipt of news of disaster I immediately, in company with Mr. Hunnicutt, Mr. Snyder, the two Bellingraths, and others, went to the place of disaster; I found that a rope had been stretched across the front of the premises, and a guard of police in charge. Upon informing the officers as to who we were, permission was given us to enter the building. I removed the debris around our pipe in order to get at every portion of it; found the cap on, and testing the joints with a lighted match showed that there was no leak at all either inside or outside of the building. If the explosion had been caused by a leak the building would have been burned before I got there. Do not think enough gas could have escaped while the connection was being made. It would have been impossible. If a man fails to make the connection at once after the cap is taken off, he could not stand the escaping gas. The escape of gas, under ordinary circumstances in making a connection, would not amount to one-half of a cubic foot. Stop-cocks outside of a building are not found to serve the purpose; the rule now is to put the stop-cocks at the meter. If a three-quarter inch pipe were open and all the space underneath the floor were filled with a mixture of oxygen and gas, the force of an explosion from such a mixture could not have raised the roof of the building in question; the floor would have been raised. The connection and pipe was put in according to my directions. I instructed Hunnicutt and Bellingrath not to put in stop-cocks outside of the building on the sidewalk."

From this testimony a great many will learn—no doubt for the first time—that carbonic acid gas will explode, by ignition, with a force equal to dynamite; and, also, that this gas is constantly working its way up from wells and sewers into our cellars, and there quietly awaiting an opportunity to "go off" the first time a match is "struck" in sufficiently close proximity.

This is certainly a terrible state of affairs—if true; but no well-digger, regardless of how ignorant he may be as to other matters, believes in the theory; for not one of them would hesitate a single instant, when about to enter into a well, to first lower a lighted candle simply for the purpose of noting whether the flame of the candle would be *extinguished* before reaching the water. He knows full well that should extinguishment occur he, too, would be "extinguished" (by suffocation) did he venture down before displacing the carbonic acid gas which "snuffed out" the candle without any explosion.

On the other hand, you will learn how very free from such dangers are all kinds of illuminating gas—especially water gas, which will not explode except under the greatest of provocation; and, further, that a sufficient quantity of it to cause an explosive mixture could not possibly be lodged in a space under a floor 20x40 feet, raised 20 inches from the ground—these, I believe, being the dimensions of the store premises destroyed at Atlanta.

This is a strange statement, indeed, to be made under oath by a man professing to understand a business fraught, under certain circumstances, with so much possible danger to life and property as is the manufacture and supply of illuminating gas. If such be his belief, what can be expected from the subordinates under his immediate direction? The very fact of dispensing with cocks outside of buildings shows he lacks a proper appreciation of the danger lurking in the element he is handling.

In the space underneath the floor of the building at No. 172 Decatur street there was room for the reception of over one thousand cubic feet of illuminating gas—after deduction being made for beams, joists, etc. To enable one to form an idea of the explosive force of gas, we have but to consider the quantity of that product required to actuate a five-horse power gas engine for one hour. Such a motor requires a supply of 110 cubic feet, and there are 90 explosions in a minute, or a total of 5,400 during the hour. Suppose, now, this should all be exploded in one minute of time instead of being evenly distributed over the sixty; as a matter of course, you would have, in the latter situation, sixty times the normal force exerted that would be obtained in any one of the other minutes when the explosions were being developed in the proper manner—in short, the abnormal system would give sixty times the power of five horses, or a total of 300.

Explosions, as we know, are instantaneous; and in a situation of this kind the force would be increased proportionately. This being the case, there can be no doubt but that enough gas could have gotten lodgment underneath the floor spoken of to have blown skyward a building many times bulkier than that of Mr. Barry's. The reason why none of the sufferers from the catastrophe showed any sign of injury from flame was because they were protected by the floor, and were not within range of the blaze, which could only be noticed around the edges or sides of, and not through, the floor planking.

It will also be news to many to hear that "its composition (carbonic acid gas) is exactly the same as fire-damp." Heretofore fire-damp was supposed to be only the dreaded enemy of the miner; and as there is no coal mine within a hundred miles of Atlanta, the good people of that city have been living unconcerned about its power to destroy whatever may come in its way. Carbonic acid gas they knew to be somewhere about them in places like wells, etc.; but, supposing it to be like unto the carbonic acid gas found in other parts of the country, they took only the ordinary precautions practiced by those dwelling in other communities. It behooves them now, if Mr. Holmes's theory is correct, to exercise greater caution in their visits to wells and descents into dark cellars, especially when carrying lighted candles, or when feeling disposed to call upon a friendly match to furnish the sometimes needed illumination.

Many other items in this batch of evidence might be commented upon with benefit to those just entering the business, showing how unsafe it would be for such to act in accordance with the theories advanced by Mr. Holmes concerning several of the points he has testified in regard to.

Yours respectfully, GAS ENGINEER.

A Statement from Mr. Walker.

DESERONTO, ONTARIO, Sept. 6, 1884.

To the Editor AMERICAN GAS LIGHT JOURNAL:

I have long since ceased to be surprised at any amount of incredulity displayed concerning the quantity of gas and condensable products which can be obtained from the destructive distillation of wood, although I had not, before reading Mr. Boardman's letter published in your issue of September 2d, found incredulity carried so far as to accuse a writer of lunacy who only states facts which have come within the range of that writer's own experience, and more especially when these facts have been published in most text books on organic chemistry for the past quarter of a century.

The statements made by me in my pamphlet on "Sawdust Gas," concerning the yield of products from wood (or sawdust) can be verified by any wood

distiller of intelligence in the country; and, further, that large quantities of good gas may be obtained from wood can be proven from the experience of those in charge of the Mutual Gas Light Company, of New York city. This company, in the month of July, 1883, carbonized about 100 cords of white pine wood in slabs which was shipped to them from this place, in order that an experimental test might be made of its capacity for producing illuminating gas. The report of the Mutual Company's superintendent shows that from each cord of pine slabs (weighing 2,417 lbs.) there was obtained 33,450 cubic feet of purified gas.

This slab wood was carbonized at very high temperatures, and nearly all the volatile products were converted into incondensable gases; and a similar result may, if desired, be obtained by subjecting a like quantity of sawdust to the same temperature. I have considered it more profitable, especially when using loose sawdust, to run the retorts at lower temperatures, and produce larger quantities of condensable products.

In order to convince Mr. Boardman, as also any other persons who may be incredulous concerning these matters, I give herewith a statement of the yield of gas, etc., obtained from the distillation of 2,000 lbs. of dry sawdust; and in corroboration give also selections from the experiments of Stolze, a German chemist:

One ton of dry sawdust, weighing 2,000 lbs., yielded—

Carbonized sawdust, or charcoal, 20 per cent., or	400 lbs.
Pyroligneous acid, 30 per cent., or	600 "
Wood tar, 5 per cent., or	100 "
Wood alcohol, 1 per cent., or	20 "
Incondensable gases, 44 per cent. (about 17,000 cubic ft.), or	880 "
Total	2,000

According to Stolze, 100 parts of dry wood gave the following products—

Woods.	Charcoal.	Gases.	Tar.	Acid and Alcohol.
Birch	24.4	22	8.6	45
Beech	24.6	21.8	9.5	44
Oak	26.2	21.7	9.1	43
Pine	21.2	23.9	13.7	41.2

It is not necessary for Mr. Boardman to accept my statements, or those of any other man, on this subject, as a simple experiment with a few pounds of wood will verify them in every particular.

In regard to the prices quoted for the residual products, it will be found on examination that I have placed lower prices on them than those obtainable as named in the market quotations for such articles. Of course, the remarkable arithmetic which Mr. Boardman quotes from his newspaper clipping is the result of the vagaries of the precise (?) proof-reader. What I really state in my pamphlet is that the cost of 300,000 cubic feet of sawdust gas is $106, or 35.33 cents per 1,000 cubic feet; but if all the condensable products, amounting in value to $101, are utilized and sold at their lowest market price, then the 300,000 cubic feet of gas will cost $5, or 1.66 cents per 1,000 cubic feet.

Respectfully,

GEORGE WALKER.

[Mr. Boardman's letter, in our last issue, was merely to show how much reliability attaches to the scribblings of the ordinary newspaper reporter when he is attempting to deal with the business of gas manufacture. We are quite positive that Mr. Boardman had no intention of ridiculing any of the statements made by Mr. Walker.—ED.]

Gas Stoves.

NEW YORK, September 10, 1884.

To the Editor AMERICAN GAS LIGHT JOURNAL:

The article of Mr. N. H. Humphrys, contained in your issue of Sept. 2, and the editorials and communications in previous numbers of the JOURNAL on the uses of gas for purposes other than that of illumination, are of special interest to gas companies and deserve to have the thoughtful attention of gas managers. That there can be developed a large and profitable increase of our business, aside from illumination pure and simple, admits of no doubt. The gas engine is becoming more popular the better its good qualities are made known; yet our gas officials seem to take but little interest in introducing them. There is need of a less costly and simpler engine than the Otto, which class of engine the writer, so far, has found to be the most satisfactory. Why should not the gas companies unite in an effort to encourage and stimulate inventors towards the direction of producing an engine that would lack complexity of construction, while also combining cheapness as a feature? Again, why should not gas companies develop the employment of gas engines by letting them out on hire under proper stipulations, and thus give parties requiring light power the opportunity of demonstrating the value, economy and convenience of the gas motor?

As to stoves for domestic use, there can be no doubt of the advantage resulting to gas companies in following the rental system—provided outright sale cannot be effected—based on reasonable rates. That proposed by Mr. Humphrys (12½ per cent. on the retail price) is a fair rental rate even for this country. No doubt the rental system, properly carried out, will induce increased consumption of gas, and that means an addition to the gas maker's profit. What is known as the "No. 8" gas range is large enough to do the cooking for a family of ten or twelve persons. When *all* the burners are in use this size of range will consume 50 cubic feet per hour, and it may be taken as the standard. Its retail cost is thirty dollars, but gas companies get a large discount from that price. This range will consume, say, 2,000 cubic feet per month, or about 20,000 cubic feet per annum. The average price of gas, as sold in our northern cities, will not be less than $2 per 1,000. That the sale of gas for cooking purposes can be made a large source of profit to gas companies can be readily demonstrated, and the advantage of keeping the house and street plant in constant use is not to be overlooked. As to the stove or range to be used, the experience of the writer is confined to only one sort of these appliances, and probably for the reason that the class tried fully answered all the needed requirements, and are quite up to the standard called for by the arguments of Mr. Humphrys.

In discussing the article from the pen of Mr. Humphrys with a gentleman having had large experience in the use of gas stoves, as well as other gas appliances, both in this country and in Europe, he gave me his general views on the subject in such a practical way that I can hardly do better than here reproduce the substance of the conversation. The gentleman said:

"Rent stoves? to be sure, if you cannot sell them; get them in use by some means. Take pains to instruct people in their proper employment, and you will find, before long, not only will the persons using them be pleased with their operation, but that your consumption will be increased. The best American stoves comply with Mr. H.'s views; and, in the main, the ranges manufactured in this country are of a better class than those sold in Europe. The best descriptions have cast iron tops and front, have a proper arrangement of taps, and are durable. All burners should be such as to give perfect combustion. Provide for a connection with a chimney flue, just as you would for any other stove, so as to carry off the products of combustion. I do not want these gases in my house. I regard the flue connection as being of a great deal of importance. Be particular that you furnish a stove that cannot explode while in charge of the most careless person.

"The construction of the stove should be simple, to the end that it can be easily and cheaply repaired; duplicate parts should always be on hand. All repairs should be done by the gas company, and done promptly—Mr. H. is sound here. Have energetic men in charge of your stove department, and have skillful mechanics to execute the work, if you would have it a success. Success also means that the chief executive officer—the president of the gas company—must show an earnest, active interest in this department of the business. Remember that your aim is to make the use of gas in this direction popular with the consumer, and profitable to yourself. Another point, and a grave one. Most of the disappointments in connection with the use of gas stoves arise from an inadequate supply of gas. This is chargeable to two reasons: first, too small a pipe connection with the stove; second, too low a street pressure carried during the day. This work, if it be worth doing at all, is worth doing well. If possible, do not make the stove connection at the end of a small pipe in the kitchen; rather make an independent connection near the meter—of not less than half-inch pipe—direct to the stove. The cost of such method is nothing as compared with the advantages secured from ensuring an abundant supply of gas. Next, keep the street pressure up—ten-tenths is not too much if you would do satisfactory work.

"What I have said in this matter is the result of a large experience covering a period of many years in this country and in Europe; and it seems to me that close attention to every detail is of the greatest importance in working up this department of the gas business. Every large gas company should have a special force for the development and spread of the use of gas for purposes other than illumination. Its superintendent should be an earnest worker, believe in what he is doing, and bring all his energy to the task in which he is engaged. With such a man at the head of affairs a largely increased send-out would soon manifest itself. Why, there are many consumers who would use more gas for cooking than they would for illumination; and they would have cheaper fuel than if they used coal, without mentioning escape from all trouble incident to the use of solid fuel."

The gas companies are greatly indebted to the JOURNAL for your practical editorials on this and kindred topics; they cannot receive too much of this sort of information, and should they give proper heed to the importance of such matter, they must of necessity receive great practical benefit therefrom.

Yours, CARBON.

A LADY SCIENTIST.—She had just finished reading an account in the *Bulletin* of the Edison display, when she laid down the paper with the exclamation: "I see that Edison is going to put in a 30-ton dynamo; I don't think that should be permitted." After meditating a while the danger seemed to be even more serious, and the protest was emphatic: "Suppose some horrid fellow should throw a lighted cigar into this; why, 30 tons of dynamite would blow up the town!"

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TUESDAY, SEPTEMBER 16, 1884.

The Market for Gas Securities.

The New York city gas share market developed no markedly interesting features during the past fortnight, although nearly all descriptions of shares are a shade below former quotations. Equitable shares alone show symptoms of strength, and sales were made at as high a notch as 95—the bear campaign of July and August in this class of security having ended in dire collapse for the gentlemen with the shaggy coats. The $600,000 of first mortgage bonds offered on sale at the Merchants' National Bank were speedily snapped up. In fact, it is reported that the total amount of bids received far exceeded the amount to be disposed of. We know of one transaction in Equitable where 200 shares changed hands in the past week, the price paid being 95. New York gas is now quoted at 158 to 162, as against 162 to 165 at beginning of month. The prevailing prices, however, should be eminently satisfactory to holders; and herewith we reproduce the quotations as reported on September 17th, 1883—the comparison of the '83 figures with those of to-day are rather likely to afford consolation to the purchasers of a twelvemonth ago. Here are the old quotations:

Harlem, 106 to 110; Manhattan, 230 to 232; Metropolitan, 185 to 190; Mutual, 116 to 118; Municipal, 183 to 187; New York, 126 to 130; and it might be borne in mind that these prices were deemed pretty steep at the time. During the interval of our last publication $10,000 worth of 9 per cent. bonds of the Havana Gas Light Company, of Havana, Cuba, were sold at auction in one lot, the price being 85. Fifty shares of New York Mutual Gas Light Company's stock sold at 125.

Brooklyn city gas shares are strong, particularly Williamsburgh, which strength is more than likely due to a probably well-founded rumor that the quarterly rate of dividend is to be advanced to three per cent. Brooklyn gas is also strongly held at advancing rates. In out-of-town shares nothing particularly away from the regular order is perceivable. In our advertising columns will be noticed a card, published at the instance of Mr. M. G. Elmore, of No. 407 Montgomery street, San Francisco, Cal., calling the attention of capitalists to a grant that has been obtained from the Hawaiian Government authorizing the establishment of a gas works in the city of Honolulu. Mr. Elmore we believe to be a thoroughly responsible gentleman, and we are of the opinion that the Honolulu scheme presents a good chance for a profitable investment. The venture may be made in conjunction with capital raised in Honolulu, or, if preferred, those inclined to take hold of the operation may do so entirely on their own account. A perusal of the annual report of the Providence (R. I.) Gas Company, given elsewhere, shows the existence of at least one corporation the stockholders of which since its start in business, over a third of a century ago, have been satisfied with a moderate return on the capital invested.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks (with W. B. SCOTT & CO.)

34 PINE STREET, NEW YORK CITY.

SEPT. 16.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share. ☜

	Capital.	Par.	Bid	Asked
Central	$466,000	50	75	90
Equitable	2,000,000	100	94	96
Harlem	2,000,000	50	121	123
" Bonds	170,000		—	—
Manhattan	4,000,000	50	295	300
Metropolitan	2,500,000	100	230	235
" Bonds	658,000	—	107	110
Mutual	3,500,000	100	124	126
" Bonds	1,500,000	1000	104	106
Municipal	3,000,000	100	205	210
" Bonds	750,000		107	110
New York	4,000,000	100	158	162
Northern	125,000	50	—	80
" Scrip	108,000			
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	130	135
Citizens	1,200,000	20	92	95
" S. F. Bonds	320,000	1000	106	110
Fulton Municipal	3,000,000	100	145	150
" Bonds	300,000		104	108
Peoples	1,000,000	10	75	80
" Bonds	200,000	—	105	110
" "	250,000	—	90	95
Metropolitan	1,000,000	100	92	95
Nassau	1,000,000	25	105	110
" Ctfs	700,000	1000	85	90
Williamsburgh	1,000,000	50	130	133
" Bonds	1,000,000	—	104	108
Richmond Co., S. I.	300,000	50	—	75
" Bonds	40,000	—	—	—
Out of Town Gas Companies.				
Buffalo Mutual, N. Y.	750,000	100	80	85
" Bonds	200,000	1000	95	100
Citizens, Newark	918,000	50	100	105
" " Bonds	124,000	—	105	110
Chicago Gas Co., Ills.			150	155
Cincinnati G. & C. Co.			187	190
Consolidated, Balt.			51½	52
" Bonds			110	111
Central, S. F., Cal.			52½	62½
Capital, Sacramento, Cal.			—	59
Hartford, Conn	750,000	25	116	120
Jersey City	750,000	20	145	150
Laclede, St. Louis, Mo.	1,600,000	100	100	—
Louisville, Ky	1,500,000	50	116	120
Montreal, Canada	2,000,000	100	186	187
New Haven, Conn		25	166	170
Oakland, Cal			28	29
Peoples, Jersey City		—	75	80
" " Bonds			—	—
Paterson, N. J		25	96	99
Rochester, N. Y		50	75	80
Washington, D. C	2,000,000	20	185	195
Wilmington, Del		50	180	190
Yonkers		50	—	40
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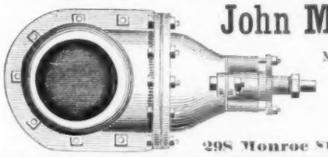

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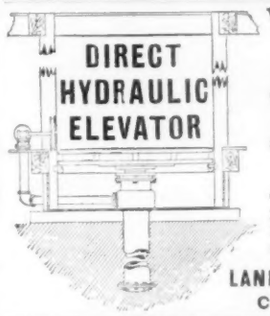

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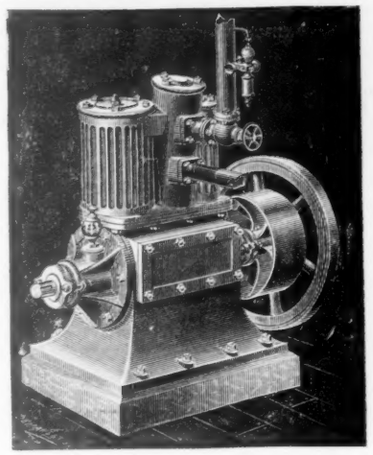

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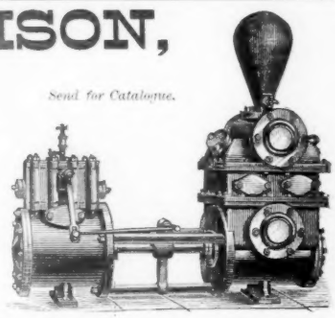

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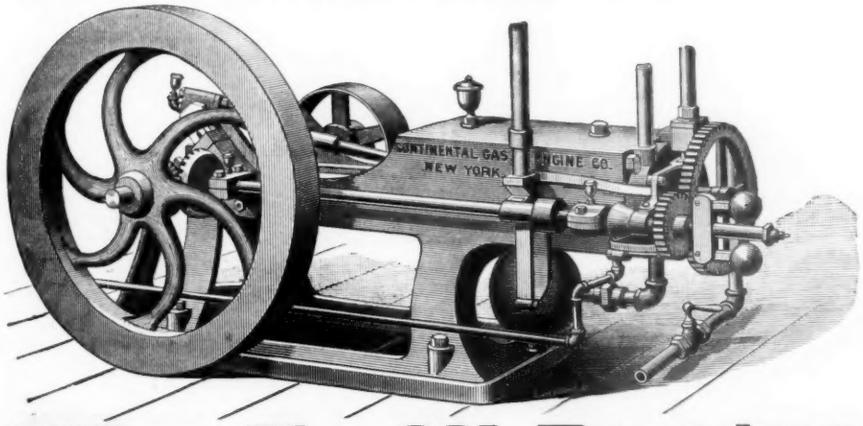

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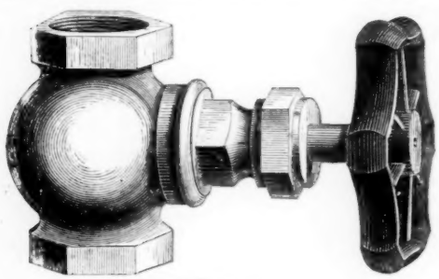

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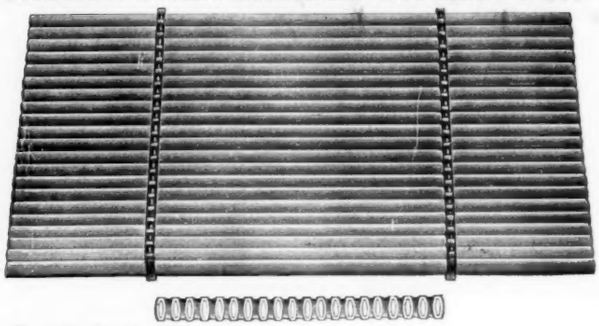

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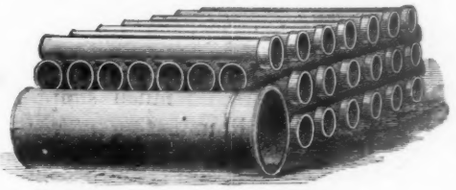

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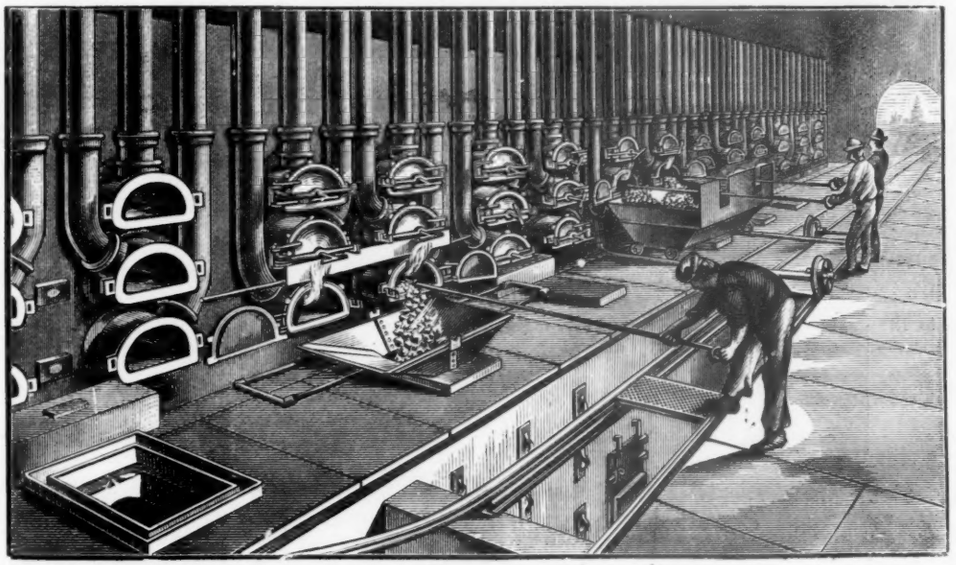

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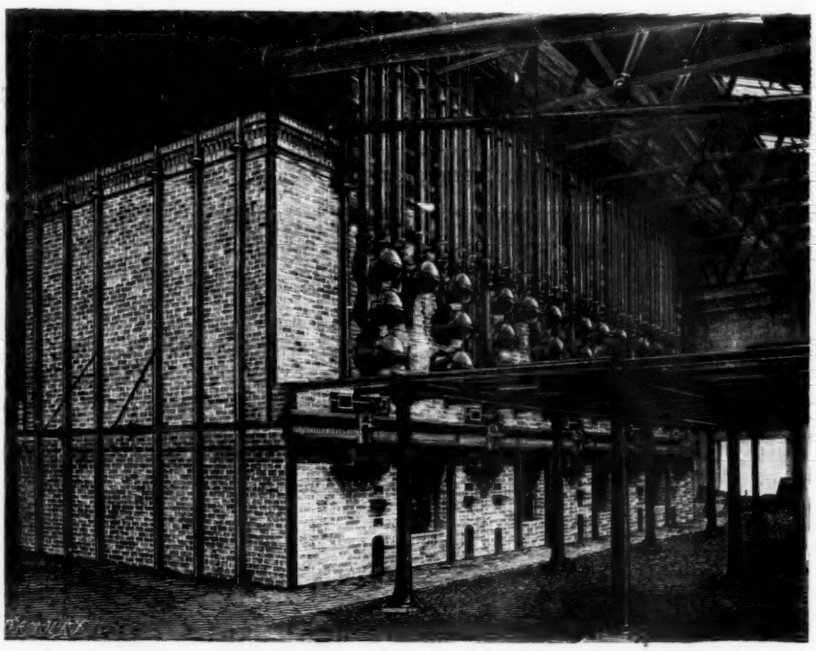

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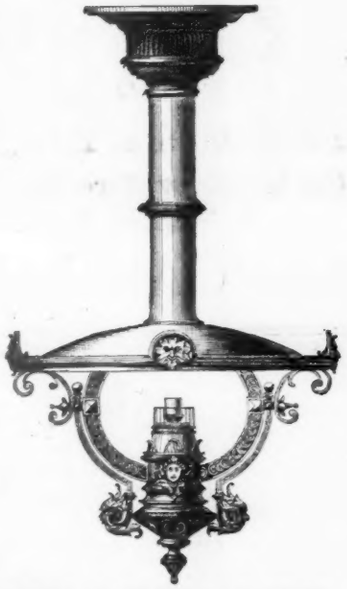

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1880	42,967,500 "
1881	36,462,500 "
1882	39,300,000 "
1883	57,735,000 "
1884	26,177,500 "
Total	235,937,500 cubic feet.

Total Number and Capacity per 24 Hours of "Standard" Washers Erected and in Course of Erection in the Several Countries

	Number.	Cubic Feet per Day.
Great Britain	151	157,070,000
Western Hemisphere	38	39,337,500
Australia	18	12,150,000
New Zealand	2	650,000
France	6	4,550,000
Belgium	8	5,420,000
Germany	16	8,200,000
Holland	4	4,160,000
Denmark	1	150,000
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Total	248	235,937,500

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Cokerei der Friedenshutte, Upper Silesia	100,000
Dumfries Corporation	250,000
Dunedin Gas Co., New Zealand	400,000
King's Lynn Gas Co	300,000
Leiden, Holland	600,000
Lincoln Gas Co	400,000
Liverpool Gas Co	2,000,000
" "	3,000,000
LOUISVILLE GAS CO	1,500,000
Numea Gas Co	100,000
PITTSBURGH GAS CO	1,500,000
PORTLAND GAS CO., Oregon	562,500
SAN FRANCISCO GAS CO	2,000,000
" "	2,000,000
Sheepbridge	10,000
ST. LOUIS GAS CO	2,000,000
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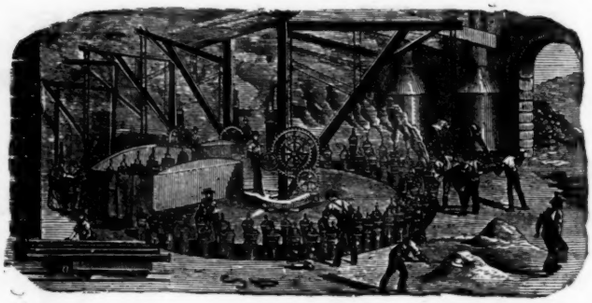

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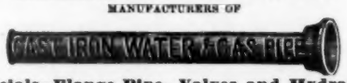

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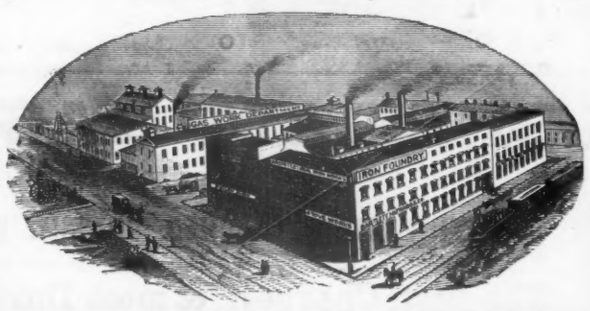

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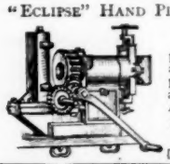

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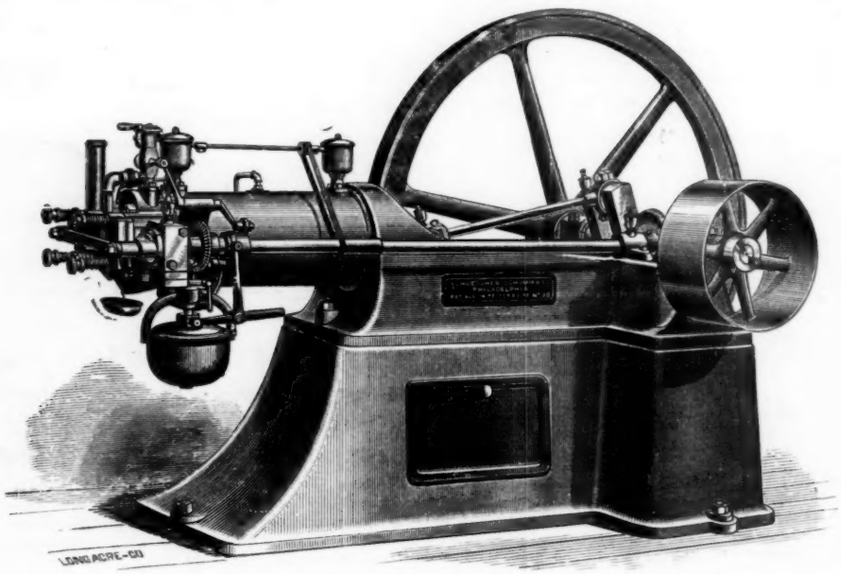

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